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AD NUMBER
AD343693
CLASSIFICATION CHANGES
TO: unclassified
FROM: confidential
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TO: Approved for public release, distribution unlimited
FROM: Controlling DoD Organization: Assistant Chief of Staff for Force Development [Army], Washington, DC 20310.
AUTHORITY
OACSFOR D/A ltr dtd 13 Sep 1973; OACSFOR D/A ltr dtd 13 Sep 1973

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ARMY CONCEPT TEAM IN VIETNAM
APO 143, San Francisco, California

343693

ACTIV-AM

⑪ 5 April-1963,

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⑥ Employment of CV-2B (Caribou) Aircraft

in Support of Counter-Insurgency Operations (U) .

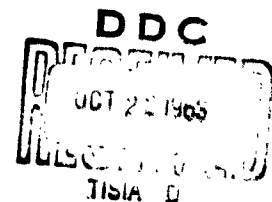
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① Monthly Report. Number 2, ,

1 March-1963 - 31 March-1963,

343693



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U. S. ARMY CONCEPT TEAM IN VIETNAM
APO 143, San Francisco, California

ACTIV-AM

5 April 1963

SUBJECT: Monthly Test Report Number 2 -- Employment of CV-2B Aircraft in Counter-insurgency Operations, 1 through 31 March 1963 (U).

TO: See Annex P.

1. (C) General.

a. Purpose of the test.

(1) To evaluate, through field test in an active theater, the performance and effectiveness of the tactical CV-2B (Caribou) company and its component elements in counter-insurgency operations, with primary emphasis on sustained support of the Special Warfare effort, forward area helicopter refueling, and operational support of ARVN (Army of the Republic of Vietnam) combat elements.

(2) To determine modifications in organization, doctrine, tactics, procedures, techniques, and equipment of the company.

b. Test concept.

(1) Data responsive to test objectives are derived from observation of combat support operations of the 1st Aviation Company (1st AVCO). The company is assigned to the USASGV (US Army Support Group, Vietnam); it is under the operational control of COMUSMACV (Commander, US Military Assistance Command, Vietnam).

(2) Test data are collected during operational missions. The test unit is not required to engage in activities whose sole or primary purpose is production of test data.

c. Test progress.

(1) Evaluation of the CV-2B capability in a medical evacuation role has been added as a test objective (see Tab M).

(2) It has been determined that the present Ground Based Air Delivery System ("Snatch and Go") fails to meet flight safety requirements. Pending resolution of these difficulties by the US Army Materiel Command evaluation of this capability as part of the test effort will be suspended (see Tab G).

(3) The test is considered to be 40 per cent complete.

2. (C) Description of the test unit.

a. Mission.

The mission of the Caribou company is to provide air transport to expedite tactical operations and logistical support in the combat zone; tasks include tactical troop lift, forward area resupply, transportation of commanders and staffs, and medical evacuation.

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SUBJECT: Monthly Test Report Number 2 -- Employment of CV-2B Aircraft in Counter-Insurgency Operations, 1 through 31 March 1963 (U).

b. Deployment of 1st AVCO.

<u>Allocation of aircraft</u>	<u>Aircraft based at</u>	<u>Missions received from</u>	<u>USMACV operational control exercised through</u>
2 to I Corps	Da Nang	Corps TOC	J3, USMACV
2 to II Corps	1 at Pleiku	Corps aviation advisor	J3, USMACV
	1 at Nha Trang	MAAG Transportation Section	J3, USMACV
2 to III Corps	Vung Tau	Corps aviation advisor	J3, USMACV
2 to IV Corps	Vung Tau	Corps flight operations section	J3, USMACV
4 to SEAAS (*)	Vung Tau	Combat Cargo Group, 2d Air Division	J4, USMACV

(*) Operations of the SEAAS (South East Asia Airlift System).

c. Statistical summary.

	<u>1-28 February</u>	<u>1-31 March</u>	<u>Southeast Asia totals to date</u>
Passengers	8914	9334	54055
Cargo (tons)	612	669	4759
Sorties	1495	1790	3285 (*)
Flight hours:			
Service	932	1036	8337
Training	40	23	225
Total	972	1059	8562
Aircraft availability	10.9 of 16 (68%)	11.6 of 16 (72.5%)	

(*) Figures available only for February and March.

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SUBJECT: Monthly Test Report Number 2 -- Employment of CV-2B Aircraft in Counter-Insurgency Operations, 1 through 31 March 1963 (U).

d. Operational summary by Corps and SEAAS.

	Corps				Corps total	SEAAS	Unit misc flts	TOTAL
	I	II	III	IV				
Passengers:								
Number	927	1255	2608	3068	7858	1168	308	9334
Tons (*)	83.4	112.8	234.7	276.1	707.2	105.1	27.7	840
Cargo (tons)	99.7	96.7	159.4	112.7	468.5	188.3	12.2	669
Sorties	170	259	438	542	1409	317	64	1790
Weight per sortie (tons)	1.08	.81	.90	.71	--	.9	--	--
Ton-miles per sortie	127	57.7	102.7	42.8	--	92.7	--	--

(*) Based on passenger weight of 180 pounds

3. (C) Content and format of report.

a. Content.

Monthly Test Report Number 1 gives background information on the 1st AVCO and on command relationships in the RVN which will not be repeated here. Monthly reports are intended to indicate progress and to provide for an orderly collection of data to be included in the final test report. All monthly reports should be consulted for full background of test activities to date.

b. Format.

Tabs A through M cover the 13 test objectives. Tabs N through O give background information and data in support of certain findings. Distribution of the report is shown at Tab P.

4. (U) References.

a. DA letter, AGAM-P(M) 381 (31 Oct 62) DCSOPS, subject: "Army Troop Test Program in Vietnam (U)", 6 November 1962, as amended.

b. ACTIV letter, subject: "Test Plan for the Tactical Transport FL/IT AC-1 (Caribou) Company," 2 November 1962.

c. CINCPAC message, DTG 070606Z Jan 63, subject: "Test Plan for the Tactical Transport Fw/Lt CV-2B (Caribou)".

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SUBJECT: Monthly Test Report Number 2 — Employment of CV-2B Aircraft in Counter-Insurgency Operations, 1 through 31 March 1963 (U).

d. USADC message, SDEG-DO S-138 DTG 131855Z March 1963, subject: "CV-2B Medical Evacuation".

16 Inclosures
List on next page

DISTRIBUTION
See Annex P

E. L. Downy
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Major General, USA
Chief

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SUBJECT: Monthly Test Report Number 2 -- Employment of CV-2B Aircraft in Counter-Insurgency Operations, 1 through 31 March 1963 (U).

LIST OF INCLOSURES

1. (Tab A) ANNEX A -- Objective 1 (Support of the Special Warfare effort).
2. (Tab B) ANNEX B -- Objective 2 (Short Field operations).
3. (Tab C) ANNEX C -- Objective 3 (Detached platoon operations).
4. (Tab D) ANNEX D -- Objective 4 (Control of airspace).
5. (Tab E) ANNEX E -- Objective 5 (Command relationships).
6. (Tab F) ANNEX F -- Objective 6 (Navigational equipment).
7. (Tab G) ANNEX G -- Objective 7 (Cargo delivery by "Snatch-and-Go").
8. (Tab H) ANNEX H -- Objective 8 (Support of airborne operations).
9. (Tab I) ANNEX I -- Objective 9 (Helicopter refueling).
10. (Tab J) ANNEX J -- Objective 10 (Weather-avoidance radar).
11. (Tab K) ANNEX K -- Objective 11 (Airborne command post).
12. (Tab L) ANNEX L -- Objective 12 (Logistical support requirements).
13. (Tab M) ANNEX M -- Objective 13 (Medical evacuation).
14. (Tab N) ANNEX N -- Letters from U. S. Senior Advisors, II & III Corps.
15. (Tab O) ANNEX O -- Ground fire damage to aircraft.
16. (Tab P) ANNEX P -- Distribution.

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ACTIV-AM
Monthly Test Report Number 2 -- Caribou

ANNEX A -- Objective 1 (Support of the Special Warfare effort)

1. (C) Objective.

To determine the capability of the CV-2B Caribou Company to air drop and support Special Warfare Teams requiring flights during daylight and darkness.

2. (C) Discussion.

a. Mission request channels for CV-2B support of Special Forces remain as outlined in the First Monthly Caribou report. I Corps Special Forces teams continue to receive all their CV-2B support from the direct support Caribou element at DaNang, while II, III, and IV Corps teams are supported by Caribou committed to SEAAS (Southeast Asia Airlift System). In accordance with USMACV policy, air transport is provided through the SEAAS to Special Forces logistical operations center (LOC) for the daily transport of 20 tons of cargo to units located in the II, III, and IV Corps areas. CV-2B aircraft operating in support of the SEAAS normally transport loads destined for the smaller airstrips serving Special Forces field units. Because of the long distances involved for the majority of SEAAS missions, the aircraft must be operated at or near a maximum fuel load, this dictates a reduced payload. Several sorties may be included in a single mission when cargo is manifested for more than one destination; in the majority of cases, the aircraft is empty for the return trip to Saigon. While the CV-2B is capable of long haul missions, its use for this purpose fails to exploit the short-haul, direct-support, tactical operations capability for which the aircraft was designed. TAB A-1 illustrates the decrease in payload with increased distance.

b. The Special Forces LOC requirement for air transport of cargo is satisfied as long as the SEAAS moves a programmed 20 tons per day. Units in the Corps areas, where requirements for supplies are based on an immediate need of critical items rather than on total tonnage moved in one day, are not provided timely service. The II Corps Deputy Senior Advisor has expressed dissatisfaction with support provided by the SEAAS because of the excessive lag time continually experienced in response to II Corps' and Special Forces' requests (See Tab M-1). Normal user request channels are from SF field detachments through the B team to Special Forces LOC which relays them to the SEAAS. The delays imposed by these channels, exacerbated by the poor radio communications with the field detachments, have resulted in an average of 7-10 days delay between the mission request and its accomplishment.

c. Because of commitments to MAAG and ARVN, approximately fifty per cent of the total requests for CV-2B support are turned down by the II Corps Aviation Officer (See Tab M-1). II Corps Army Aviation records show that approximately five per cent of the total SF tonnage in II Corps is transported by direct support CV-2B. To transport critical items on short notice, e.g., weapons, ammunition, and deadlined vehicle parts the Special Forces Team at Pleiku normally requests assistance through the II Corps Aviation Officer for Army Aviation resources in direct support of Corps.

d. The Senior Advisor to II Corps, has requested two additional direct support CV-2B's to rectify the shortage of Caribous to meet his requirements. (Tab N-2).

e. Direct CV-2B support of Special Forces Teams continues to be most discernable in I Corps. 29.1% of total CV-2B tonnage transported in I Corps was for Special Forces. 67.6% of this was air dropped. Tonnage transported this month shows a decrease of 66% over last month. This decrease resulted from an

TAB A

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Monthly Test Report Number 2 -- Caribou

ANNEX A -- Objective 1 (continued)

exchange of SF B teams in DaNang in the middle of March; the new team initially required only a small amount of cargo by CV-2B. (See Tab A-2)

f. Much of the Special Forces air-transported cargo is bulky and light. This includes building materials (thatch and bamboo matting), clothing, blankets, sand bags, and rations (Tab A-3). This type of cargo accounted for approximately 82% of Special Forces sorties flown by CV-2B in I Corps. CV-2B transport under the SEA Airlift System has included a quantity of like materials. Data on the specific percentage is not available. Dimensions of certain types of this cargo (e.g., construction materials and large baskets for live rations) preclude use of smaller Army aircraft normally more economically suited for low tonnages.

g. The 1st AVCO conducted a Special Forces paratroop mission on 5 March in which five members of Special Forces Team and 100 pounds of cargo were dropped on Hoa Cam drop zone (near DaNang) as a demonstration for ARVN troops (Tab A-4). The same teams were air dropped by CV-2B aircraft at night over a lighted smudge pot "T" at Hoa Cam. The capability of the Caribou to drop personnel has not been exploited in any tactical operations in the RVN.

3. (C) Findings.

a. The short field and load carrying capabilities of the CV-2B aircraft could be better exploited if used on short rather than long haul resupply missions.

b. II Corps Special Forces units have requested CV-2B support because the SEA Airlift System reaction time is not sufficiently responsive to their needs.

c. II Corps has requested two additional CV-2B aircraft to support Corps Area Logistical Command (CALC) and Special Forces requirements in its zone.

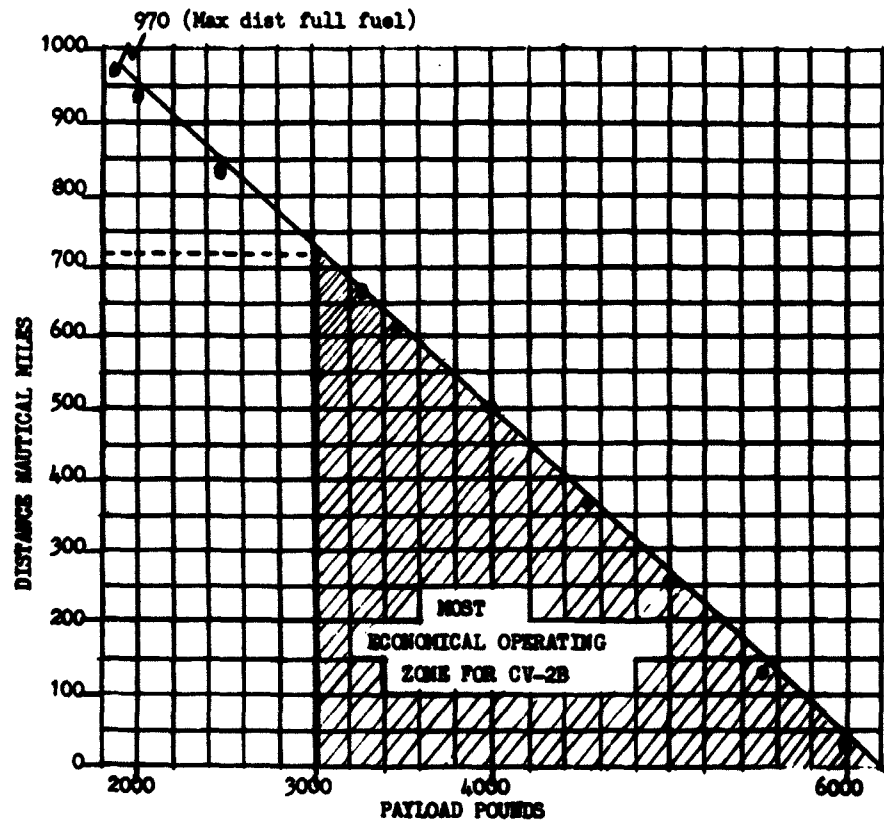
d. The CV-2B Caribou configuration is suitable for transporting bulky lightweight SF cargo such as construction materials which utilize nearly all the cubic capacity of the cabin. These cargos, which are typical of SF logistical requirements in the RVN, indicate that cargo weight alone is not a valid criterion by which to determine efficient aircraft utilization.

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Monthly Test Report Number 2 -- Caribou

(Normal cruise - 2000 rpm, 32.5" manifold pressure, 5000 feet altitude)



Aft wt: 20,200 lbs
Crew (4 X 200lb): 800
Arm'd crew seats(2): 254
Self-sealing fuel tanks: 280
Oil: 270
21,804 lbs

Maximum gross wt: 28,500 - 21,804
Available for a/cft fuel & pay load = 6,696

*Note: Addition of self sealing fuel tanks reduces CV-2B fuel capacity by 660 lbs (110 gals) and endurance by approx one hour.

NOTE: 1st Avn Co uses $\frac{1}{2}$ max pay load (Approx 3000 lbs) as an economical load minimum. This fixes the economical operating distance in the 0-710 N.M. area. Radius of action is reduced to the 0-305 N.M. area (RA = $\frac{710}{2}$)

TAB A-1

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I. CV-2B Support to Special Forces

(a) By Southeast Asia Airlift System (II, III & IV Corps areas only)

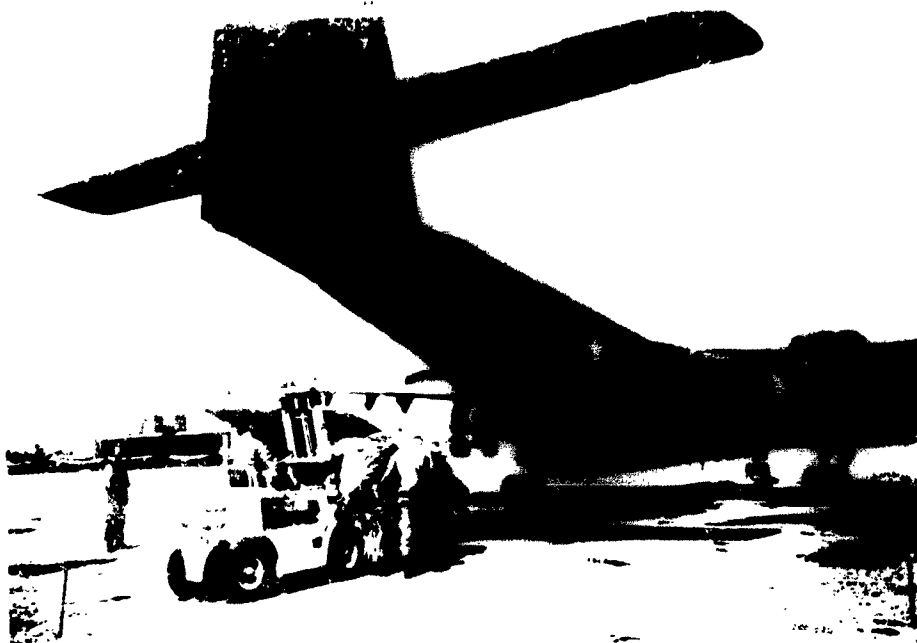
- (1) Passengers - 1,168
- (2) Cargo (Tons) 188.3
- (3) Sorties 317

(b) Direct Support to Special Forces in I Corps only. (Exclusive of SEAAS)

- (1) Passengers - 134
- (2) Cargo (Tons) Airlanded 9.4
 Airdropped 19.6
 Total 29.0
- (3) Sorties - 49

II. Total Special Forces Support by CV-2B (Paragraph A & B above)

- (1) Passengers - 1302
- (2) Cargo (Tons)- 217.3
- (3) Sorties - 366



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05/10/70

1. 000000 05-24 at 10:00 AM for air drop



Special Forces "kicker" releases sketch from 05-28 over Mr. Thant drop zone,
12 May 1970

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TAB A-3

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Monthly Test Report Number 2 -- Caribou

ANNEX B -- Objective 2 (Short field operations)

1. (C) Objective.

To test the capability of the CV-28 Caribou company to operate from airfields and locations with reduced runways, unimproved surfaces and approaches, and under varying weather conditions, day and night.

2. (C) Discussion.

a. Many areas occupied by ARVN tactical units cannot easily be supplied by surface transportation because of insurgent action. As a result, the RVN has placed emphasis on airfield construction and on improvement of airstrips close to tactical units. During the past two months sixteen additional airstrips have become operational, all of which are used by the 1st AFVC.

b. The MACV military directory of airstrips (cited in Caribou Report Number 1) is under revision to include airfields which have recently been constructed or improved. Military aviation units and the Civil Aviation Assistance Group - United States Operations Mission to Vietnam (CAAG-USOM), furnish information to USMACV on airfields they use or for which they are responsible. The MACV directory lists all information pertinent to usability of airfields in the RVN except that which pertains to airfield design loading. Low capacity sub-grade soil conditions in the RVN make design loading information particularly important. Without design load data, no determination can be made of what aircraft (by type and weight) can use available airfields on a continuous basis without undue airfield deterioration.

c. Information concerning the airfields used by 1st AFVC is shown in Tab B-1. This list contains only those airfields used on a regular basis. They are part of the USMACV list of 128 airfields in the RVN (cited in Annex B, February Caribou Report), 122 of which can be used by the CV-28.

d. CAAG-USOM publishes airfield data for use of RVN civil aviation. The latest publication (1 Jan 63) is attached as Tab B-2. It provides data on each of the 47 civil airfields under the RVN National Airport Plan, to include specific information on airfield design load limitations. Since MACV has not as yet included airfield design load data in its directory, the only valid basis for comparison between different aircraft (e.g., by weight and type aircraft) is the data published by CAAG-USOM on the civil airfields (47). Using the CAAG-USOM criteria, the CV-28 at gross load (14.5 tons) is within the design limitations of 36 (77%) of the civil airfields in the National Airport Plan. With reduced load, the CV-28 meets design limitations for 39 (83%) of the airfields. Using the same criteria, the C-123 at gross load (23 tons) meets design limitations for 5 (11%) of the airfields.

e. Airstrip construction problems in the RVN were discussed in the Army Tactical Mobility Requirements Board Report (see Tab B-3). Soils in the Camau Peninsula and much of the Mekong Delta (designated as 1 on the soils map of Tab B-4) have CBR values less than 4 and are considered impractical for construction methods outlined in this appendix. Construction elsewhere in the RVN for Army Transport landings appears feasible, though in rough terrain or heavy vegetation construction time is in excess of 60 U.S. battalion days. Construction time is tripled for C-130 type facilities. Plan of Test (Tab B-5), Office of the Secretary of Defense/Advanced Research Project Agency (OSD/ARPA) discusses soil problems peculiar to the Ca Mau Peninsula where certain subgrade soils

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Monthly Test Report Number 2 -- Caribou

ANNEX B -- Objective 2 (continued)

have a CBR of less than 1, in fact as low as 0.25. These problems preclude, for the moment, economical designs for fields to accommodate medium or heavy cargo aircraft, and place at a premium a light transport aircraft suitable for low capacity runways. Empirical data demonstrate the capability of the CV-2B to use the fifteen strip for which it has mission requirements in the Ca Mau-Mekong Delta area without causing noticeable deterioration. The CAAG-USOM theoretical design data lists maximum loadings for eleven of these strips -- all of which are greater, under dry conditions, than the maximum gross load of the CV-2B.

f. Use of unimproved runways and approaches in the RVN involves peripheral airstrip security. Fifteen landing areas are now listed as "hot" i.e., CV-2B's have received ground fire near these areas) by the 1st AVCO. These include: A Loui, An Long, Bato, Can Tho, Cement Plant, Gia Vuc, Hai Han, Hiep Hoa, Mang Buc, Plateau Gi. Sa gon, Tabat, Tay Ninh, Thu Dau Mot, and Trung Lap. During the month of March, five CV-2B's were hit by small arms ground fire at five different geographical locations -- Gia Vuc, Cantho, Tabat, Trung Lap, and at one unknown location (see Tab O). These incidents resulted in the first injuries to people flying in the Caribou. A passenger was fatally wounded near Can Tho on 10 March, and a 1st AVCO crew chief received leg wounds during take-off from Trung Lap airstrip on 14 March. It is I Corps policy for the transportation movement control officer to request VNAF fighter escort for all flights into the Corps' list of "hot" areas. Similar policies have not been established in the other corps, and CV-2B's generally perform their missions unescorted. Personnel armor protection now consists of armored vests and groin protectors (worn by all CV-2B crew from the beginning of 1st AVCO operations in the RVN). While there is presently no protective armor installed in the CV-2B's, armor kits for aircrew protection are being fabricated and will be installed in the aircraft in the near future.

3. (C) Findings.

a. 1st AVCO Caribous have commenced operations at sixteen additional airstrips during the past two months.

b. The gross weight of the CV-2B is within the design limitation of 36 (77%) of the 47 airstrips for which maximum loadings are listed by the CAAG-USOM.

c. Improvement of certain airstrips, particularly in the Mekong Delta and Ca Mau Peninsula area to accommodate medium and heavy transport aircraft (25-35 ton gross load) is impractical under present conditions.

d. The CAAG-USOM provides runway strength figures for eleven of the fifteen airstrips used regularly by CV-2B's in the Ca Mau-Mekong Delta area. All of the eleven are adequate for the CV-2B at maximum gross load.

e. Five CV-2B's were damaged by ground fire in March compared to the previous monthly average of 1.67.

f. The injury of a crew chief and the death of a passenger attest to the increasing accuracy of insurgent's anti-aircraft fire and point up the need for installing protective armor in the CV-2B.

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TAB B

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ANNEX B -- Objective 2 (continued)

AIRFIELD NAME	TOWER*	NAVIGATION AID	RUNWAY LIGHTING	DIMENSIONS	SURFACE
Aloui				1300' X 135'	Laterite
An Khe				3674' X 130'	Clay & Sod
An Loc				4700' X 270'	Grass & Gravel
An Long				3700' X 110'	Laterite
Ashau				3350' X 55'	PSP & Laterite
Bac Lieu				2500' X 50'	Laterite
Ban Don				1300' X 155'	Sod
Bao Loc (BLAO)				2624' X 120'	Laterite & Sod
Ban Me Thout (City)				4550' X 130'	Laterite & Clay
Ban Me Thout	Yes(C)	Yes	Yes	3937' X 98'	Asphalt
Bato				1420' X 115'	Earth & Laterite
Be Tre				3445' X 140'	Macadam
Bien Hoa	Yes(M)	Yes	Yes	5800' X 70'	Laterite & Sod
Ca Mau				1650' X 70'	Natural graded
Con Son				3773' X 100'	Natural graded
Camly (Dalat)				3820' X 94'	Macadam
Can Tho				3350' X 100'	Asphalt
Cao Lanh				1300' X 43'	Gravel
Cay Gao				2580' X 130'	Natural graded
Cheo Reo				4425' X 98'	Clay & Sod
Cement Plant				1800' X 100'	Laterite
Courtenay				4419' X 130'	Rolled Earth
Cu Lao Re				3900' X 100'	Laterite/Sand
Bujamap				2540' X 66'	Compact Earth
Dakir				3280' X 115'	Laterite & Sod
Dak To				3750' X 80'	Laterite
Dalat	Yes(C)	Yes	Yes	4855' X 131'	Asphalt
Da Nang	Yes(C)	Yes	Yes	7872' X 199'	Asphalt
Dong Ha				3580' X 95'	Laterite
Dong Xoi				1700' X 130'	Dirt
Doung Dong		Yes		3280' X 98'	Asphalt
Duc My				1100' X 50'	Clay Sod
Gia Vec				2700' X 85'	Laterite
Ham Tan				1800' X 98'	Laterite
Hiep Hoa				2000' X 70'	Gravel
Quan Loi				4500' X 50'	Gravel/Grass plantation
Hue (Phu Bai)	Yes(C)	Yes		5100' X 130'	Asphalt
Hue (Citadel)				1900' X 55'	Packed Earth
Kham Duc				4300' X 110'	Crushed Rock
Khe Sanh				1509' X 180'	PSP
Kontum		Yes		3936' X 135'	Laterite & Grass
Lai Khe				4180' X 80'	Sod Sand
Kauong Kho				1900' X 100'	PSP
Ha Tien				2300' X 170'	Laterite
Hon Quan				1800' X 130'	Dirt
Loc Ninh			Yes	3700' X 65'	Oiled Laterite
Long Than				3350' X 130'	Laterite & Grass

*Military Tower - M
Civilian Tower - C

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Monthly Test Report Number 2 -- Caribou

ANNEX B -- Objective 2 (continued)

AIRFIELD NAME	OWNER	NAVIGATION AID	RUNWAY LIGHTING	DIMENSIONS	SURFACE
Long Toan				3445' X 98'	Treated Gravel
Long Xuyen				3445' X 98'	Asphalt
Moc Hoa				3500' X 120'	Laterite
Ngok Tavak				3480' X 120'	Asphalt
Nha Trang	Yes (C)	Yes	Yes	6028' X 164'	Asphalt
Nhon Co (Gia Nhia)				4265' X 98'	Roller Laterite
Ninh Hoa				1378' X 140'	Laterite
Phan Rang				3650' X 98'	Laterite & Sod
Phan Thiet		Yes		2300' X 65'	Oiled Laterite
Phouc Vinh				2300' X 150'	Natural graded
Phouc Hoa				2040' X 98'	Laterite
Plateau Gi				2800' X 50'	Laterite
leiku (New)	Yes (M)	Yes		6000' X 130'	PSP
leiku (Old)	Yes (M)	Yes		5000' X 150'	PSP
Juang Ngai				3500' X 95'	Laterite
Quang Tri				1450' X 140'	Sod
Qui Nhon	Yes (M)	Yes		3937' X 98'	Asphalt
Rach Gia				3000' X 150'	Asphalt
Saigon	Yes (C)	Yes	Yes	9960' X 150'	Concrete
Soc Trang	Yes (M)	Yes		3284' X 98'	Asphalt
Song Be (Mui Bara)				3940' X 150'	Laterite/Sod
Song Mao				2490' X 87'	Laterite/Sod
Tabat				1550' X 98'	Earth
Tan Hiep (My Tho)				2000' X 106'	Laterite
Tay Ninh				1700' X 110'	Roller Earth
Tam Ky				1500' X 94'	Sod
Thu Dau Mot				2952' X 280'	Dirt
Tue Trang				2385' X 153'	Natural graded
Tre Vinh				3020' X 147'	Natural graded
Trung Lap				1100' X 98'	Sod
Quy Hoa (North)				1400' X 65'	Sod
Quy Hoa (South)				3631' X 131'	Asphalt/Gravel
Vinh Long				3300' X 97'	Treated Gravel & Laterite
Vi Thanh				1200' X 100'	Sod
Vung Tau	Yes (M)	Yes	Yes	3900' X 130'	PSP
Buoiop				1650' X 65'	Earth & Sod
Di Linh				1640' X 60'	Laterite & Sod
Dan Tiang				4700' X 150'	Sod
Hiep Khan				1100' X 150'	Laterite
Lao Bao				1100' X 65'	Gravel & Laterite
Tra My				1641' X 50'	Natural Surface
Phu Trach				1500' X 100'	Laterite & Sod
Quang Tri New				2624' X 98'	Laterite
Traica				2526' X 80'	Dirt
Cong Son				1476' X 109'	Sand & Sod
Krung Kho (An Lac)				1800' X 150'	PSP
Nong Son (Dai Phung)				1600' X 98'	Clay
Pleim Rung				1900' X 160'	Graded Earth
Van Canh (Dak To Cu Old)				2000' X 120'	Sod
Van Canh				1462' X 97'	Laterite

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ACTIV-AH

Monthly Test Report Number 2 -- Caribou

ANNEX B -- Objective 2 (continued)

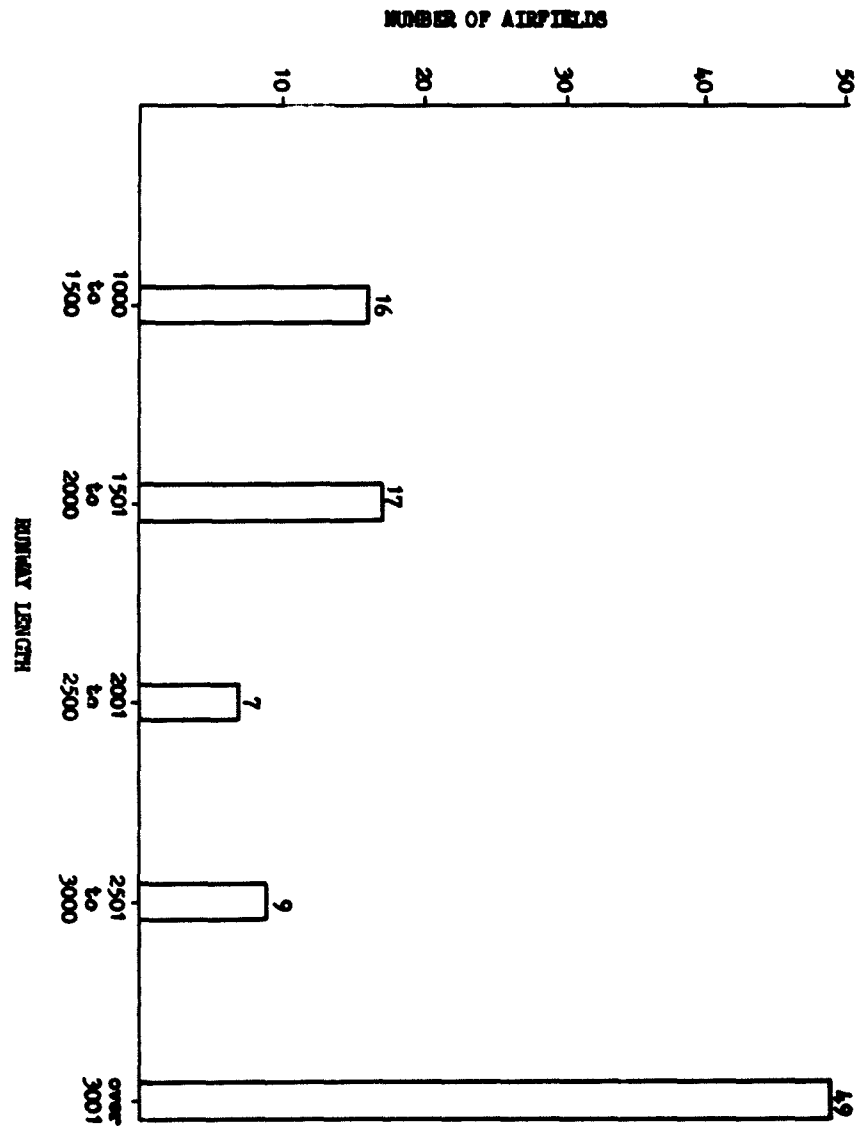
Summary of Runway Lengths and Surfaces

1. Runway length	Number of Airfields & Strips	Percent of Total
(a) 1000' to 1500'	16	16.3%
(b) 1501' to 2000'	17	17.3
(c) 2001' to 2500'	7	7.2
(d) 2501' to 3000'	9	9.2
(e) over 3000'	49	50.0
2. Runway surface		
(a) Concrete	1	1.0
(b) Asphalt or Macadam	12	12.2%
(c) PSP	7	7.1
(d) Laterite (oiled or rolled)	22	22.5
(e) Natural graded and natural surface	8	8.1
(f) Sod and combination of sod and other material	22	22.5
(g) Clay, gravel, grass, earth, sand, and runways with mixed surfaces excluding sod type runways	26	26.6

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ACTIV-AM
Monthly Test Report Number 2 -- Caribou

ANNEX B -- Objective 2 (continued)

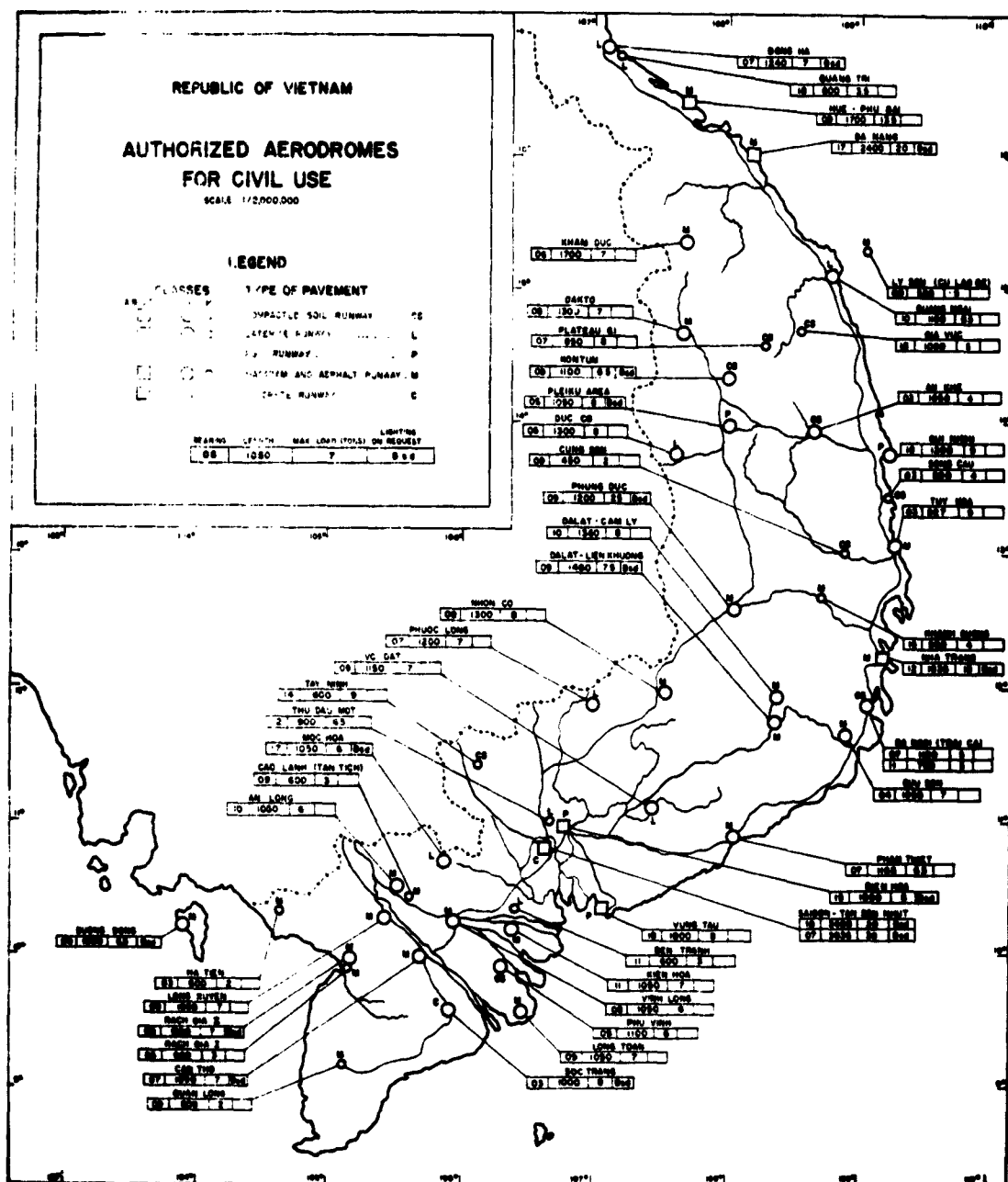


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SCALE 1 / 2,000,000

CLASSES		TYPE OF PAVEMENT
1	1	COMPACTED SOIL RUNWAY
2	2	GRAVEL RUNWAY
3	3	GRAVEL RUNWAY
4	4	GRAVEL RUNWAY
5	5	GRAVEL RUNWAY
6	6	GRAVEL RUNWAY
7	7	GRAVEL RUNWAY
8	8	GRAVEL RUNWAY
9	9	GRAVEL RUNWAY
10	10	GRAVEL RUNWAY
11	11	GRAVEL RUNWAY
12	12	GRAVEL RUNWAY
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97	97	GRAVEL RUNWAY
98	98	GRAVEL RUNWAY
99	99	GRAVEL RUNWAY
100	100	GRAVEL RUNWAY

WEARING	LEAFLET	MAN LOAN (FOES)	LIGHTING ON REQUEST
08	1080	7	0 0 0



CONTROL BY MEMBER TEACHERS SECTION

NATIONAL AIRPORT PLAN - VIET NAM

Location	PRESENT PROGRAM			REQUIREMENTS NEXT 5 YEARS	PROBABILITY AND COMPLETION DATE	REQUIREMENTS NEXT 10 YEARS	PROBABILITY AND COMPLETION DATE
	Alignment & Length (Meters)	Condition	Strength (Tons) Dry - Wet				
DONG HA	07-1200	Fair	13 10			Repair runway	Not probable
QUANG TRI	18-600	Fair	5 3				
HUE-PHU BAI	09-1700	Good	30 30	New tower. Runway lights	1961-62		
HUE-THANH NOI	12-550	Fair	5 3			Repair runway	Not probable
LANG CO	Survey and engineering completed			Construction	Probable Indefinite		
DA NANG (Tourane)	17-2400	Fair	30 30	New terminal and tower Runway lights - strengthen and lengthen runway to 3000m	1961-62 1962-63		
QUANG NGAI	10-1000	Good	15 15				
GIA VOC	01-1000	Poor	5 3	Repair runway	Not probable	Same	Probable
PHUKHION	Survey and engineering completed			Begin construction	Probable Indefinite		
AN KHE	03-1120	Fair	13 10	Repair runway	Not probable	Same	Probable
QUI NHON	18-1200	Fair	20 20			New runway	1966
SONG CAU	03-500	Good	5 3	Completion			
CUNG SON	09-450	Under Constr.		Completion	1960		
TUY HOA	07-827	Fair	20 15				
	03-927	Good	20 20				
KHANH DUONG	15-550	Fair	5 3	Completion			
NHA TRANG	12-1830	Good	30 30	Install runway lighting	1962	Strengthen runway and install drainage	1967
	05-1250	Good	15 10				

Location	PRESENT PROGRAM		REQUIREMENTS NEXT 5 YEARS	PROBABILITY AND COMPLETION DATE	REQUIREMENTS NEXT 10 YEARS	PROBABILITY AND COMPLETION DATE
	Alignment & length (Meters)	Condition	Strength (Tons) Dry - Wet			
DALAT-CAMILY	10-1336	Good	10 10		Repair runway	Not probable
BA NGOI - TRAI CA	07-1100 11-760	Poor Poor	10 - 10 -		(Closed to traffic) Repair runway	
PHAN BANG - KI DUC	12-1115	Poor	- -		Abandon - New runway to be located at Thap Cham Completion	1961 1962
THAP CHAM	04-1050	Under construction				
BAO LOC	02-500	Dry season only				
VO DAT	09-1150	Under const.	14 14		Completion	1960
DALAT -						
LIEN KHUONG	09-1480	Good	20 20		Install runway lighting	1962
PHAN THIET	07-1165	Fair	20 20			
VUNG TAU	18-1800	Fair	18 -		Repair runway	Probable 1966
VAM LANG	07-1050	Survey and engineering completed			Const. project canceled	
GO CONG	09-1050				Const. work canceled	
VINH LONG	08-1050	Fair	14 14			
BINH DAI	08-1050				Const. work canceled	Probable-Indef.
KIEN HOA	11-1050	Fair	14 12			
KO CAY	07-1050	Survey and engineering completed			Const. work canceled	1960
PHU VINH	05-1100	Fair	14 12			
LONG TOAN	09-1050	Good	14 14			
CAN THO	07-1050	Fair	14 14		Runway 1700m and apron	
BA XUYEN	03-1000	Fair	18 18			Install runway lighting 1966
GANH HAO	09-1050	Survey and engineering completed			Construction	1966
AN XUYEN MOT (Quan Long)	09-1050	Under const.	14 14		Completion	Probable-Indef. 1960
AN XUYEN CU	09-600	Fair	7 5			1966
ONG DOC	09-1050	Survey and engineering completed			Construction	Probable-Indef.
CHAC BANG	09-1050	Survey and engineering completed			Construction	Probable-Indef.
VI THANH	08-1050	Under const.	14 14		Completion	1963
KIEN GIANG	08-1050	Good	14 14			
PLATEAU G. I.	07-850	Fair	10 10		Repair runway. New proposed runway will be located at 5km south existing airfield.	Not probable 1966 Probable

CHART 1

PRESENT PROGRAM				REQUIREMENTS NEXT 5 YEARS	PROBABILITY AND COMPLETION DATE	REQUIREMENTS NEXT 10 YEARS	PROBABILITY AND COMPLETION DATE
Location	Alignment & length (Meters)	Condition	Strength (Tons) Dry - Wet				
LONG TUYEN	08-1050	Good	14 14				
PHU QUOC (Duong Dong)	08-1000	Good	15 15				
SAIGON (Tan Son Nhut)	07-9036	Good	135 135	Construction and installation ILS - Hi-intensity approach and runway lighting.	1964	Install runway lighting Construct new terminal bldg.	1966 1967
	18-2400	Good	60 60	Construct stopways, turn-offs, grading and widening of shoulders.			
AN LONG	10-1050	Fair	14 14				
MY QUI	09-1050	Survey and engineering completed.		Construction	Probable-indef.		
THU DAU MOT	12-900	Poor	15 15	Repair runway	1961		
TAY NINH II	14-800	Poor	8 5	(Military airfield)			
TAY NINH I	13-1000	Fair	15 8	Repair runway	No "		
	05-1350	Fair	15 8	"			
BIEN HOA	18-1300	Fair		(Military airfield)	1963		
	15-1800	Fair	13	Completion			
MIHON CO	09-3048	Under const.					
	08-1300	Good	15 15	Const. work canceled	1960		
DUC TUYEN	13-500			Construction	Probable-indef.		
LAC THIEN	Survey and engineering completed			Install runway lighting	1962		
BAN ME THUOT (PHUNG DUC)	09-1200	Good	40 40				
KHAI LO	09-1200	Survey and engineering completed		Construction			
DUC CO	05-1300	Good	15 15				
PHIEU-CATBEA	07-1400	Fair	13 13	Repair runway	Not probable		
PHIEU-AREA	05-1400	Fair	15 10	Repair runway	1962		
	17-1060	Abandoned	15 10				
DARTO MOI	08-1300	Under const.	14 14	Completion	1960		
KONUM	09-1200	Under const.	13 10	Completion	1963		
TRA MY	Survey and engineering completed			Construction	Probable-indef.		
A LUOI	13-150	Fair	5 5	Repair runway	1961		

CHART 1

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Extract from: Army Tactical Mobility Requirements Board Report 20 August 1962

ESTIMATES OF ENGINEER TROOP CONSTRUCTION EFFORT

IN IRAN, THAILAND, AND SOUTH VIETNAM (U)

1. (U) Purpose. This tab summarizes the effects of environmental factors on airfield construction time in Iran, Thailand, and South Vietnam. The impact on environmental conditions on construction effort is shown on colored maps of these areas. Construction time estimates give the range of Engineer battalion days required to construct an Army airfield in dry and wet seasons.

2. (C) Airfield Design. The type of airfield used in this evaluation consisted of 1000 feet of 100-foot-wide runway, a 180- by 750-foot apron, and approximately 1500 feet of 60-foot-side taxiway. This involves some 36,000 square yards of graded surface. Extension of the runway and connecting taxiway to 3000 feet would double the Engineer construction time range listed. Extension of the runway to 4500 feet would approximately triple the construction time range. This study was based on the premise that by proper site selection at least one airfield of the type outlined could be built in any area within a 25-mile-diameter circle in the time indicated with present Engineer troops.

3. (C) Design Aircraft and Surfaces. The specific aircraft envisioned is an Army transport weighing approximately 100,000 pounds and having a 10-ton load-carrying capacity. The airfield life envisioned is somewhere between 2 weeks and 1 month without requiring major reconstruction. The aircraft would have landing gear that would permit operation directly on graded soils of CER 10 or better without surfacing. On graded soils in the CER 4 to 10 range a present inventory landing mat surfacing would be required (M-6, M-8, M-9). Areas requiring landing mat are cross-hatched on the construction-effort maps. Soils having a CER of less than 4 were considered impractical because Engineer construction equipment would not operate unless the area were first covered with a blanket of imported granular fill. In mountainous terrain or areas of heavy forest, the construction might be accomplished but would require more

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than 2 battalion months. This time requirement was considered to be outside the scope of the problem.

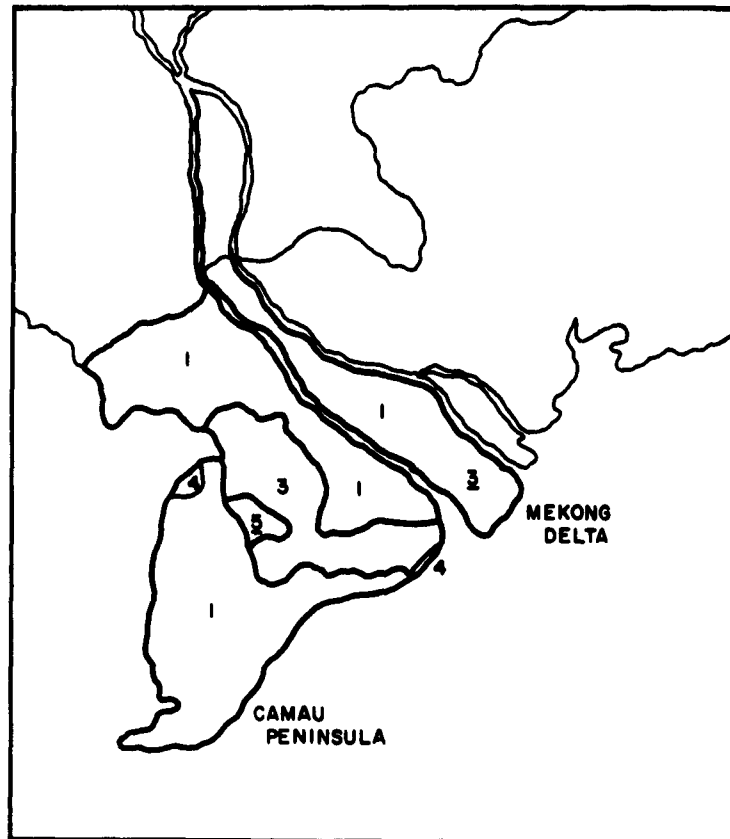
4. (C) Requirements for Larger Aircraft. To determine the time requirements for producing an airfield capable of supporting C-130 operations, construction time in the following tables should be tripled because the C-130 requires a runway in excess of 4000 feet. Surfacing requirements would be essentially the same, except that the experimental T-11 landing mat would be required instead of the present inventory mat. Construction time would not be increased. This points up the desirability of placing the T-11 mat in the supply system as rapidly as possible. If the T-11 mat is not available, some 6 to 15 inches of imported base course would be necessary under the present inventory mat. This would so increase construction time as to make construction infeasible in the cross-hatched areas. It should be mentioned that the time required to place landing mat is about 1.5 battalion days for areas of the basic size or about 4.5 battalion days for a 4500-foot runway. Thus, landing mat is in reality more a logistics problem than a construction-time problem. Further, it cannot be assumed that construction time would be decreased by using more than one Engineer battalion per airfield because a one-battalion construction force will saturate an area of the size under consideration. More troops would likely retard progress rather than speed the construction.

5. (C) Color Code. Within the general outline presented above, the construction of the basic 1000-foot airfield in areas shown in green would require less than 1 battalion month: (0-10 battalion days, light green, numbered 3; 10-20 battalion days, medium green, numbered 4; 20-30 battalion days, dark green, numbered 5). The areas shown in brown and numbered 2 would require more than 2 battalion months because of rough terrain, heavy vegetation, or a combination of these and other environmental factors. The areas shown in brown and number 1 are those upon which construction equipment would not operate because of lack of bearing capacity.

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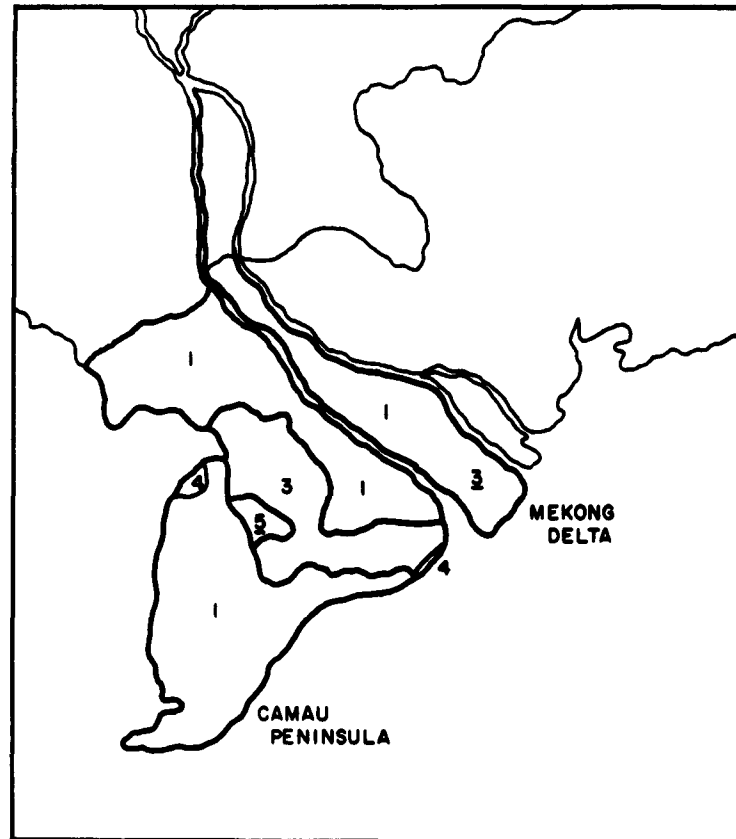
ACTIV-AM
Monthly Test Report Number 2 — Caribou

ANNEX B — Objective 2 (continued)



LEGEND		
AREA	CBR	CONS TIME (BN DAYS)
1	< 4	IMPRACTICAL
2	N/A	> 60
3	4-10	0-10
3	> 10	0-10
4	4-10	11-20
4	> 10	11-20
5	4-10	21-30

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Monthly Test Report Number 2 — Caribou
ANNEX B — Objective 2 (continued)



LEGEND		
AREA	CBR	CONS TIME (BN DAYS)
1	< 4	IMPRACTICAL
2	N/A	> 60
3	4-10	0-10
3	> 10	0-10
4	4-10	11-20
4	> 10	11-20
5	4-10	21-30

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PLAN OF TEST

"Employment of Chemical Grouting Agents for Stabilization of Sub-Marginal Soils"

1. References:

- a. Ltrs, American Cynamid Company to Mr. Phillip Franklin, OSD/ARPA, dtd 2 Nov and 29 Nov 1962.
- b. Miscellaneous paper (draft), WES, "Evaluation of Airstrip at Binh Hung, South Vietnam"
- c. Brochure, "AM-9 Technical Data", American Cynamid Company.

2. Purpose.

To determine the suitability of chemical grout (American Cynamid Co. S-3403) as a soil stabilization agent for sub-marginal soils such as those found in the lower Mekong Delta area of South Vietnam.

3. Background.

- a. The specific area to be investigated is the Ca Mau peninsula region (Vic Binh Hung, Cai Nuoc, Cai But, Dam Dai).
- b. An evaluation of the soil in a representative section of this general area (Reference b) determined that, in general, the natural material is a uniform, greyish-brown soft clay with relatively high organic content. The mechanical characteristics of the soil are such that it is considered entirely unsuitable for normal airfield construction methods (e.g. CBR=0.25, percent saturation=90, such drying as occurs takes place via transpiration from natural cover, watertable varies from surface to 15" depending upon whether wet or dry season, too weak to support conventional construction equipment). Normally, a CBR of 3 is considered the absolute lower limit for even forward liaison airstrips.

4. Concept.

- a. The concept is to employ GVN facilities and personnel, through channels available to CDTC, to conduct a preliminary series of laboratory tests to ascertain the effects of chemical grout S-3403 on soils of this nature, and determine an optimum soil-grout mix of acceptable strength, watersealing and density characteristics.
- b. The CDTC Project Officer will monitor the tests, provide liaison with GVN and ARVN personnel, collect and evaluate test data and write the report. LTCOL Joseph E. Halloran Jr. will be the officer responsible in the OSD/ARPA R&D Field Unit.

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Monthly Test Report Number 2 — Caribou

ANNEX C — Objective 3 (Detached platoon operations)

1. (C) Objective.

To determine the capability of the CV-2B Caribou Company to support tactical operations requiring platoons to operate away from base airfields to include security requirements, logistical support, communications, maintenance and administration.

2. (C) Discussion.

There has been no change in CV-2B method of employment since the beginning of the test. Present method of employment is discussed in monthly Test Report Number 1.

TAB C

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TAB C

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ACTIV-AM

Monthly Test Report Number 2 -- Caribou

ANNEX D -- Objective 4 (Control of airspace)

1. (C) Objective.

To determine the most efficient method of controlling air space where the CV-2B Caribou Company must operate in support of tactical operations, considering allocation of altitude, arrival and departure from base fields, movement over the tactical forces, and landing or airdropping in the forward areas.

2. (U) Discussion.

No additional significant data were developed during this period.

TAB D

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TAB D

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ACTIV-AM

Monthly Test Report Number 2 -- Caribou

ANNEX E -- Objective 5 (Command relationships)

1. (C) OBJECTIVE.

To determine the appropriate command relationships of the CV-2B Caribou company in support of tactical operations.

2. (C) DISCUSSION.

a. Command relationships of the 1st AVCO have not changed since publication of Monthly Report Number 1.

b. Two Caribou provide direct support to each Corps. Priority of support by Caribou committed to the SEAAS is given to the four Corps.

c. U.S. Senior Corps advisors continue to state requirements for additional direct support Caribous.

3. (U) FINDINGS.

None

TAB E

TAB E

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ACTIV-AM

Monthly Test Report Number 2 -- Caribou

ANNEX F -- Objective 6 (Navigational equipment)

1. (C) Objective.

To determine the appropriate navigational equipment, both in the aircraft and on the ground, which will provide positive location as needed.

2. (C) Discussion.

Present navigational systems installed in the CV-2B are inadequate for operational missions in the RVN under marginal weather conditions. Nearly all missions in support of counter-insurgency operations in the RVN are to destinations not located on established airways and to airfields without instrument approach facilities (see Tab F-1). Of the 98 airfields used regularly by CV-2B's, only 15 have navigational aids (low frequency non-directional beacons or very high frequency omni-directional range stations); 11 have approved instrument approaches; 12 have radio tower communication facilities; and only eight have runway lighting. CV-2B pilots must use maps, landmarks, and compass headings as primary means of navigation for over 90 per cent of the missions. When weather is marginal, missions are delayed or cancelled because of inadequate navigational systems. High priority missions are often flown despite weather conditions. Such operations are extremely hazardous in the mountainous north where maps are often inaccurate and weather conditions change rapidly. Successful completion of these missions can be attributed mainly to the aircrews' familiarity with the terrain over which the missions are flown. Such hazards can be eliminated and CV-2B weather capability can be increased by an additional navigational system which provides accurate location of the aircraft in relationship to the terrain. One of the navigational systems already developed such as the Doppler System, the PFNS (Position Fixing Navigational System), or TAPS may satisfy the requirements and should be evaluated in the CV-2B.

A limited number of small low-frequency radio beacons (Pathfinder Beacons) have been issued to outposts in the mountainous terrain of I Corps. Although their range is limited to a few miles they have been helpful in locating these outposts during periods of low visibility.

The 1st AVCO has expressed a desire to have an FM radio homing capability. This would increase the company's marginal weather capability, and assist in locating tactical units during periods of low visibility.

3. (C) Findings.

1. Present navigational systems installed in the CV-2B aircraft are not adequate for the location, during periods of marginal weather, of tactical drop zones or airstrips without ground radio aids. A determination of appropriate navigational equipment cannot be made until such systems as Doppler, PFNS and TAPS (DPCCA) are evaluated.

2. Small portable low frequency beacons (Pathfinder Beacons) have been useful in locating outposts during periods of low visibility.

3. Installation of FM homing equipment would provide additional navigational assistance in locating tactical units, particularly during periods of low visibility.

TAB F

TAB F

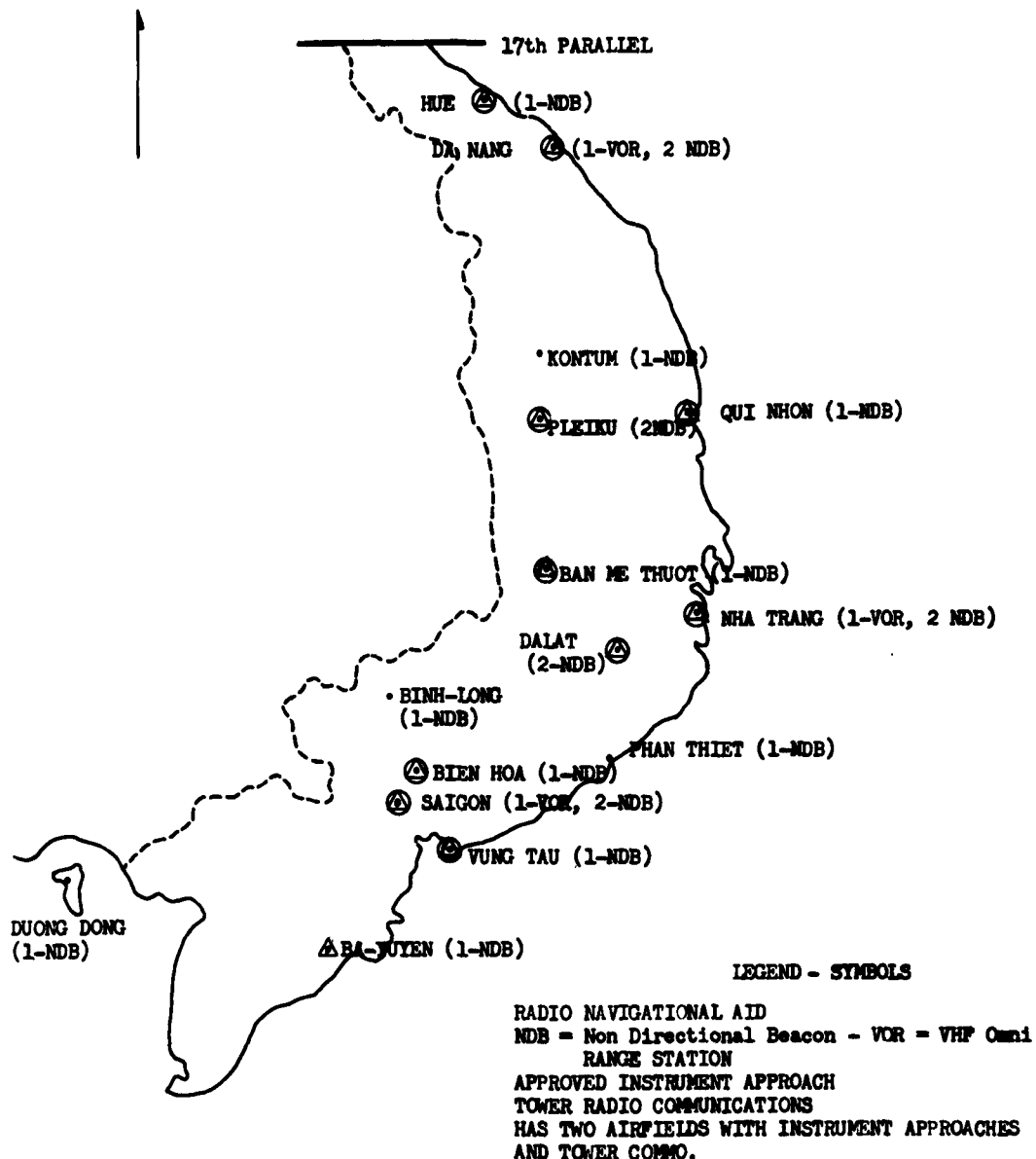
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ACTIV-GM
Monthly Test Report Number 2 — Caribou

ANNEX F — Objective 6 (Navigational equipment)

Navigational Aids, Instrument Approaches and Tower Radio Communications within the Republic of Vietnam.



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ACTIV-AM

Monthly Test Report Number 2 -- Caribou

ANNEX G -- Objective 7 (Cargo delivery by "Snatch-and-go")

1. (C) Objective.

To determine the capability of the CV-2B Caribou aircraft to deliver loads through use of the "snatch-and-go" delivery technique to areas which prohibit landing, to include determination of the proper altitude for contact with the ground mechanism, length of cleared area needed, and characteristics of minimum approach obstacles.

2. (U) Discussion.

a. The final phase of the U.S. Army Materiel Command's evaluation of the "Snatch-and-Go" was conducted at Fort Bragg, N.C., 3-9 March 1963. Results of this evaluation were submitted to U.S. Army Materiel Command by the QMR Research and Engineering Command in a letter dated 14 March 1963, subject: "Procurement of Operational Test Quantities of Ground Based Air Delivery Systems," which is quoted in part below:

"7. Recommendations: It is the unanimous recommendation of the participants:

a. To terminate flight testing of the All American Model 24A and the Van Zelm 12A-201 Ground Based Air Delivery Systems due to their failure to meet flight safety requirements when used with the CV-2 series aircraft ---

--- d. To discontinue the plans for operational tests of these systems and comply with the provisions of the message referenced in paragraph 1e. (See Tab G-1)

e. That the systems required for overseas tests be returned to the Quartermaster Research and Engineering Command for study in conjunction with task ANL 148, "Touch-and-Go Air Delivery System for Caribou Aircraft."

b. Evaluation of CV-2B capability will be suspended pending final action on QMR&E Command's recommendations.

3. Findings.

None.

TAB G

TAB G

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ROUTINE

072136Z

FM DA WADG

TO RUHFA/CINCPAC

RUHAFS/CINCUSARPAC FT SHAFTER HAWAII

RUAMC/COEUSA SEOUL KOREA

RUABFB/CGUSARHAW SCHORFIELD BKS HAWAII

UNCLAS DA321259 FROM DCSOFS/AV SFD ACTCOM

1. THIS IS A SAFETY OF FLIGHT DIRECTIVE.
2. IN CONNECTION WITH AIRMOBILE TRAINING EXERCISES WHERE TROOPS ARE REPELLED FROM HOVERING HELICOPTERS BY MEANS OF ROPE. IT IS MANDATORY THAT THE CREW CHIEF REMAIN IN THE HELICOPTER IN ORDER THAT HE MAY TAKE NECESSARY ACTION TO FREE THE ROPE IN THE EVENT OF ENTANGLEMENT WITH TREE LINES AFTER DISCHARGE OF TROOPS.
3. THE IN-FLIGHT DELIVERY OF EQUIPMENT WITH THE AC-1 CARIBOU USING NON-STANDARD EXTRACTION TECHNIQUES SUCH AS THE GROUND BASED TOUCH-AND-GO SYSTEMS BEING PROPOSED BY ALL AMERICAN ENGINEERING COMPANY AND VAN ZELM ASSOCIATES, INC., IS NOT AUTHORIZED PENDING THE DEVELOPMENT AND PUBLICATION OF STANDARD PROCEDURES AND TECHNIQUES.

TOR: 152331Z

MACV 504/16 NOV 62 DTG: 072136Z NOV 62

ACTIV-AM

Monthly Test Report Number 2 -- Caribou

ANNEX H -- Objective 8 (Support of airborne operations)

1. (C) Objective.

To determine the capability, coordination, logistical implications, communications, and maintenance required to support an airborne battalion operation, to include initial drop or air landing, resupply for 3 to 5 days, and pick-up and redeployment.

2. (U) Discussion.

No significant data were developed during this period.

3. (U) Findings.

None

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ACTIV-AM

Monthly Test Report Number 2 -- Caribou

ANNEX I -- Objective 9 (Helicopter refueling)

1. (C) Objective.

To determine the capability of CV-2B Caribou aircraft to furnish a refueling capability for use by helicopters, to include determination of maximum fuel load, application of internal fuel container and pumping system, number of helicopters which can be refueled simultaneously, and extension of helicopter radius action.

2. (C) Discussion.

a. Helicopter refueling problems during tactical operations.

(1) Information regarding refueling problems has been furnished by the 57th Transportation Company (CH-21) which is employed in support of III and IV Corps.

(2) In operations away from their base airfield at Tan Son Nhut in Saigon, CH-21's are sometimes refueled from one or more of six 1200 gallon M49C tank trucks spotted at selected sites throughout the Delta area. Each of the M49C tank trucks is resupplied by commercial haul over insecure land routes or waterways. The six tank trucks cannot be assembled in a common area to support large numbers of helicopters involved in tactical operations.

(3) More often during tactical missions helicopters are refueled from a fifty-five gallon drum with a 15 gallon-per-minute hand pump. Fifty-five gallon drums of aviation fuel are pre-positioned at selected airstrips by commercial carrier. Drums may remain at the various airstrips indefinitely and may or may not be secure from theft or tampering. Even in secured areas storage may be improper and fuel in drums often becomes contaminated by the time it is required for refueling aircraft. Under such conditions quality assurance of aviation gasoline is difficult to accomplish. Fuel deterioration and contamination are common complaints. The only filtering devices available are chamois skins laid over funnels. Using this system it takes approximately 20 minutes to refuel a CH-21. Since only one or two hand pumps are normally available, refueling is time-consuming. Effectiveness of tactical operations suffers by the long turn-around time entailed in such antiquated methods.

(4) There are a number of smaller airstrips, most of which are not secured, where fuel is not pre-stocked. Although these strips may be tactically well located for a given assault mission, they cannot be used as a base for refueling unless fuel can be delivered under relatively secure conditions.

b. Concept of Test.

(1) It is the intent of this test objective to devise a system whereby bulk fuel can be flown into a forward airstrip via the CV-2B and dispensed into the CH-21 and UH-1 utilizing 50 gallon-per-minute pumps. If the equipment is suitable, it will allow use of many additional airstrips for refueling bases. Such a system would expedite refueling and would be less prone to alerting insurgents of an impending operation since fuel would not have to be carried to an airstrip several days in advance.

(2) It is anticipated that each CV-2B can carry two 500 gallon non-vented collapsible tanks mounted internally. Dispensing equipment will include

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ACTIV-AM
Monthly Test Report Number 2 -- Caribou

ANNEX I -- Objective 9 (continued)

one 50 gallon-per-minute (gpm) electrically powered pump, two 160-foot sections of newly developed discharge hose, and allied hose manifolding. The amount of fuel to be carried will depend on the actual weight of the dispensing equipment, the weight per pound of the fuel being supplied, the radius of action the CV-2B is to fly, and the weight of the air crew and personnel to operate the dispensing equipment.

(3) Under this concept CH-21's will be refueled directly from the "flying tank truck". As soon as the fuel has been dispensed the Caribou will fly out of the area to return only if further fuel is required by the helicopters.

(4) An alternate concept to be tested is that of flying the refueling systems to a tactical airstrip and off loading them for ground dispensing fuel into helicopters. Under this concept, fuel would be supplied to the ground systems from the CV-2B internal refueling system. Caribou could fly shuttle flights to keep the ground systems replenished. Only one major modification must be made. There must either be an additional portable auxiliary power unit for the electrically operated pump or a gasoline powered pump must be substituted for the electric pump. Testing of this alternate concept is necessary because:

(a) Some airstrips that could be used for refueling do not provide sufficient space for parking of more than one Caribou during refueling operations.

(b) The refueling exercise may extend over such a period of time that it would be impossible to keep the CV-2B aircraft down for such an extended time.

(c) The amount of fuel required for the helicopters may be of such large quantity that it will be necessary to use the available Caribou in a fuel-shuttling service.

c. No additional POL equipment (e.g., 50 gpm electrically operated pumps with allied hose attachments) or information relative to component weights have been received in RVN since submission of the last report. Except for the collapsible drums, all items of equipment tested thus far were used for this test only because they were locally available. The status of the equipment to be tested is unknown at this time. Therefore, equipment tests have been made using the following substitute items:

(1) Pump assembly, 50 gpm Barnes Model, gasoline powered.

(2) Hose, 50 ft section, 1½ inch, discharge (Three sections coupled together to form 150 foot length).

(3) Hose, 25 ft. section, 2 inch, suction (Two sections, one of which was cut into 16 ft. and 9 ft. pieces for adaption as a manifold).

d. Tests of POL equipment to support the assigned objective arbitrarily have been placed in four phases to allow for more complete prior planning and better time utilization. The objectives of each of these tests are to:

(1) Phase 1 -- Ground test equipment outside the CV-2B aircraft.

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ANNEX I — Objective 9 (continued)

- (a) Test following equipment:
 - 1. 500 gal collapsible tanks
 - 2. 50 gpm electrically powered pump
 - 3. 160 feet of discharge hose (per pump)
- (b) Train personnel in use of equipment and in helicopter refueling procedures.
- (2) Phase 2 — Ground test equipment utilising the CV-2B. Determine:
 - (a) Best method of loading 500 gal collapsible tanks on-board aircraft.
 - 1. Empty/full
 - 2. Palletised/non-palletised
 - 3. Position within aircraft
 - (b) Best method of tying down (rigging) tanks.
 - (c) Best method of operating 50 gpm pump; i.e., inside/outside CV-2B.
 - (d) Most efficient placement of Caribou —GH-21 for refueling operations.
 - (e) Train personnel
- (3) Phase 3 — Flight test equipment in a non-tactical situation.
 - (a) Determine maximum loads of fuel that can be carried in the CV-2B.
 - (b) Train personnel
 - 1. Caribou crews — emergency evacuation procedures
 - 2. Caribou crews — familiarise with characteristics of flying while carrying a liquid load.
 - 3. Further develop concepts and practice all phases of helicopter refueling.
- (4) Phase 4 — Test concepts and procedures during an actual tactical situation.
 - (a) Evaluate procedures, make necessary modifications in equipment and/or procedures and retest, if necessary.
 - (b) Write final report, draw conclusions, and make recommendations.

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Monthly Test Report Number 2 -- Caribou

ANNEX I -- Objective 9 (continued)

e. As of 31 March 1963 preliminary testing has progressed through the first phase, as outlined in paragraph 2d(1) above. Further tests within the first phase are still necessary. Subsequent paragraphs discuss factual data already collected.

(1) The equipment which has been tested is listed in Tab I-1 and shown in the diagram attached as Tab I-2 to this annex. Photographs of the equipment on the ground are included as Tab I-3.

(2) Approximately 940 gals of AVGAS can be pumped from two non-vented 500 gallon collapsible tanks, using a 50 gpm pump, in 17 minutes. The tanks, connected in series with a single pump source, can be filled or emptied either individually or simultaneously. The only flow-controlling device is the elbow coupling mounted on each tank, which may either be closed or opened as desired. To maintain more even weight-load distribution aboard the aircraft it is more advantageous to discharge from the tanks simultaneously. Although each tank contains about 495 gallons when filled, design deficiency of the tank precludes pumping out of approximately 25 gallons leaving a net available for dispensing of 470 gallons.

(3) Initial investigation indicates that the total weight of fuel-handling equipment is too heavy to allow for the maximum fuel carrying capability of the system (1000 gallons). Using the weight of the present POL system and fuel (plus a 20 minute reserve) sufficient for a 50-mile radius-of-action operation, the CV-28 can only carry 824 gallons of AVGAS payload without exceeding its maximum allowable gross weight (Aircraft and POL system weights are listed in Tab I-1). The weight of the dispensing equipment itself must be reduced before the concept becomes fully feasible.

(4) A sequence for loading and discharging the equipment and fuel has been devised. These procedures are considered the most feasible and are listed in Tab I-4.

(5) Dispensing equipment under test has no intergral metering apparatus. Exact quantities of fuel cannot be measured. Also, during the helicopter missions which this equipment is designed to support, aviators often want a precise amount of fuel rather than a full tank.

(6) Another disadvantage of the available equipment is the lack of filtering device within the system. Filter-separation of aircraft fuel is a critical requirement. Final filtering of the fuel is now accomplished when the product is transferred from the M131A3 or M49C tank truck into the 500 gal collapsible tanks. Unless the tanks, manifolding, pump and hose line system are clean, there is a good chance of contamination. A final filtering device should be placed between the discharge side of the pump and the receiving helicopter (Ref: par 18c, TM 10-1107).

3. (C) Findings.

a. The amount of fuel that can be carried by the CV-28 is limited (by the present weight of dispensing equipment) to 824 gallons within a 50-mile radius-of-action flight.

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ANNEX I -- Objective 9 (continued)

b. The weight of the substitute fuel handling system materially reduces the pay load of fuel which can be carried in the CV-2B. Unless the overall equipment weight can be reduced materially the entire concept of using the Caribou as a refueling vehicle may require reappraisal.

c. Two major deficiencies inherent to the available refueling system are the lack of a metering device and a fuel filtering system.

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ANNEX I -- Objective 9 (continued)

CV-2B POL SYSTEM FOR HELICOPTER REFUELING

The following equipment has been used in the first test phase. Equipment is shown in the diagram attached as Tab I-2; photos are attached as Tab I-3.

1. <u>ITEM</u>	<u>FEDERAL STOCK NO.</u>	<u>QUANTITY</u>	<u>WEIGHT</u>
Drum, collapsible, 500 gal.	8110-753-4892	2 ea.	520 lbs.(260 lbs ea.)
Pump assemble, 50 gpm, gasoline powered and hoses	4320-271-1858	1 ea.	155 lbs.
Hose, suction, 2 inch	4720-555-8325	50 ft.	88 lbs.
Hose, discharge, 1½ inch	4720-303-4984	150 ft.	114 lbs.
Nozzle, 1½ inch	4930-360-0569	1 ea.	5 lbs.
2. Aircraft weight (includes parachutes and survival gear)			20,200 lbs.
Crew (4@ 200 lbs.)			800 lbs.
Armored crew seats (2 ea)			254 lbs.
Self-sealing fuel tanks			280 lbs.
*POL dispensing and allied equipment			882 lbs.
Aircraft engine oil			270 lbs.
		TOTAL.	22,686 lbs.
CV-2B maximum allowable gross weight			28,500 lbs.
Total weight A/C, crew, FOL equipment etc.			22,686 lbs.
Total of A/C fuel and full payload that can be carried. .			5,814 lbs.(936 gals)

Aircraft fuel (plus 20 minutes reserve) required for
50 mile radius-of-action operation (based on 670 lbs. per hour
at 150 knots). 670 lbs. (112 gals)

*A portion of this equipment is made up of substitute items. It is anticipated that the system weight will increase when standard items are received and installed.

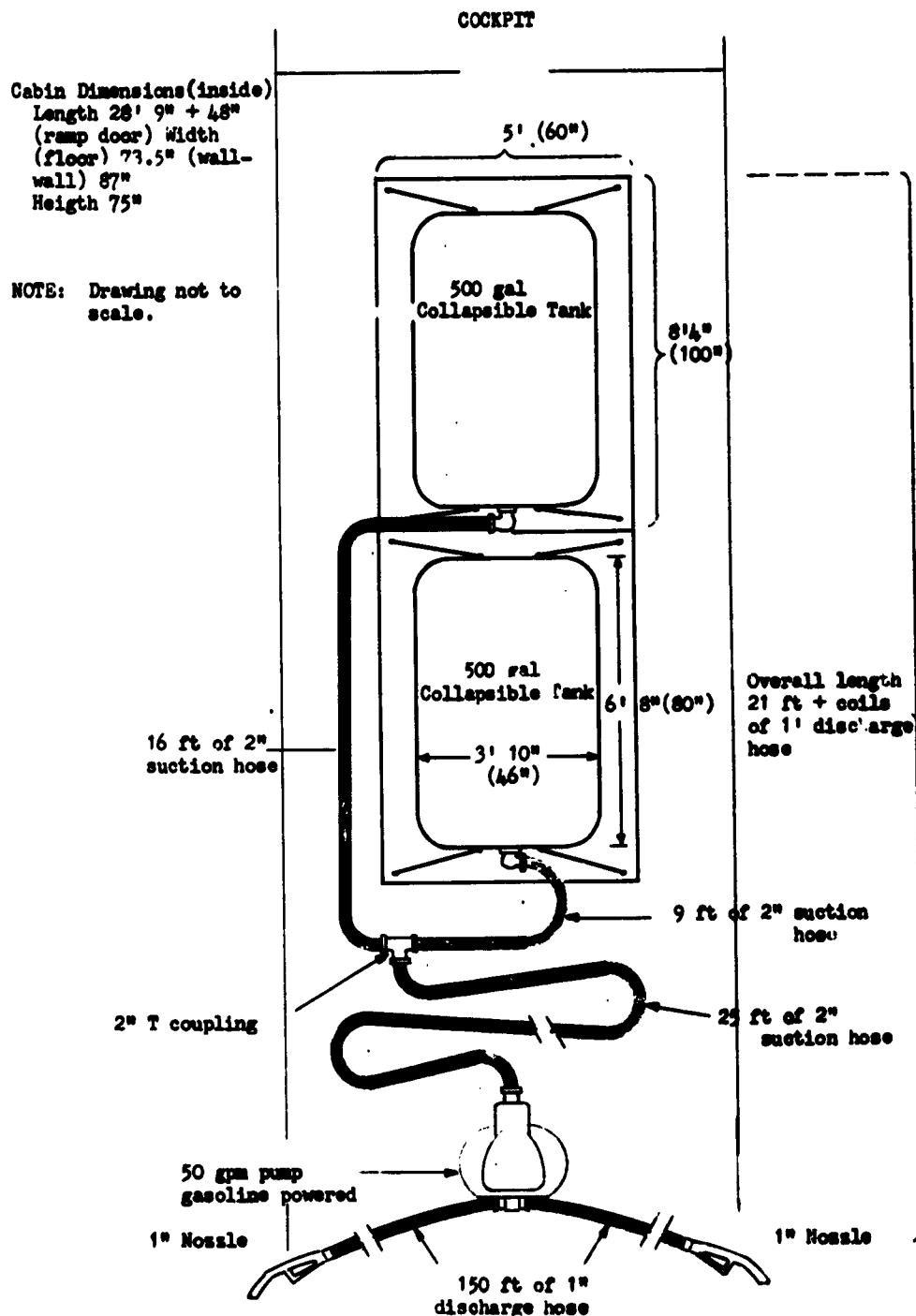
TAB I-1

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Inclosure 2 to ANNEX I - Objective 9
 Subj: POL Refueling Equipment Set-up in CV-2B (Proposed)

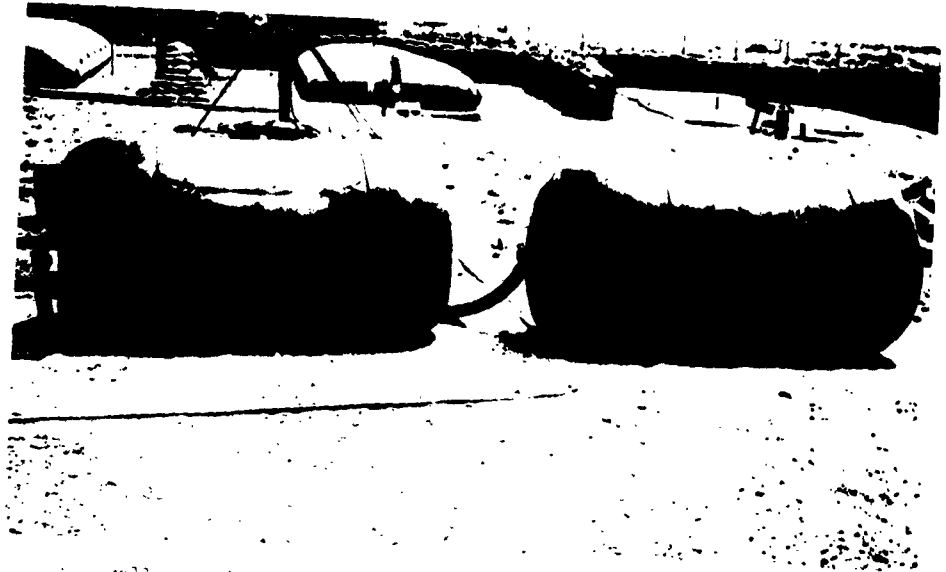


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 15 ft 1/2 test report, and 1 -- test,
 ASTM 1 -- collective 9



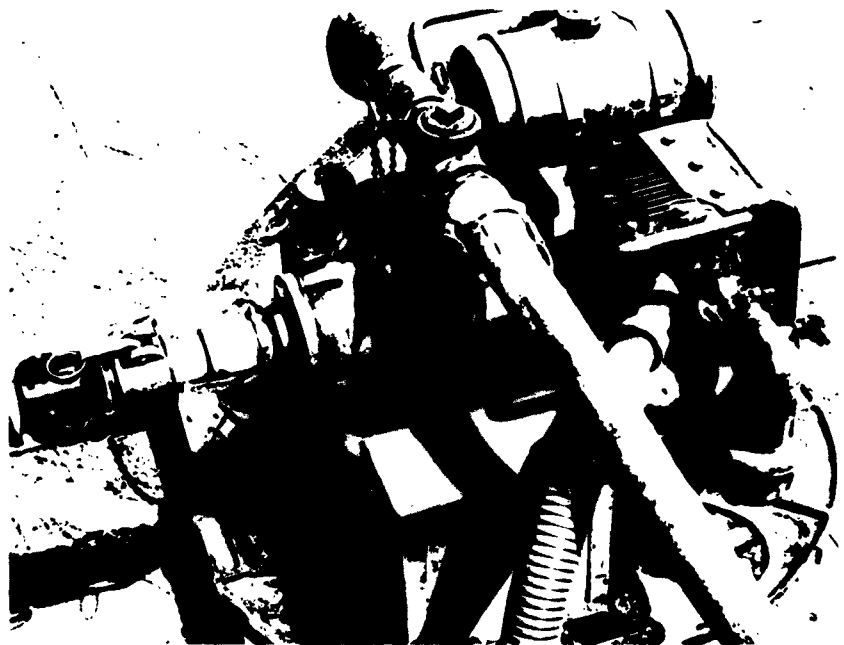
15 gallon, 15 ft 1/2 test report, and 1 -- test



15 gallon, 15 ft 1/2 test report, and 1 -- test



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ANNEX I — Objective 9 (continued)

Recommended Procedures for Loading and Discharging Equipment and Fuel.

1. Loading procedures:

- a. Position tanks inside the CV-2B and secure.
- b. Connect suction hoses to the elbow valves on the two tanks.
- c. Leave 50 gpm pump outside aircraft.
- d. Connect suction hose to quick-coupling adaptor on the hose line from the M131A3 or M49C tank truck.
- e. Pump from tank truck into collapsible tanks simultaneously until desired amount of fuel has been metered through.
- f. Close elbow valves on collapsible tanks.
- g. Disconnect suction hose from tank truck hose and connect suction hose to suction port of 50 gpm pump.
- h. Connect 150 ft section of discharge hose to 50 gpm pump, and reel hose as tight as possible.
- i. Load pump and hose-lines into aircraft and tie down pump.
- j. Readjust and tighten the collapsible tank tie-downs.

2. Discharging procedures:

- a. Place 50 gpm pump on ground about 15 feet from end of ramp. (The gasoline driven pump is removed from the aircraft as a safety precaution; however, when it is replaced by the electrically operated pump the electric pump will not be removed from the aircraft.)
- b. Ground the pump and the aircraft.
- c. Pull the 150 ft. hose to the helicopter to be refueled.
- d. Bond the hose nozzle to the helicopter and prepare to fuel.
- e. Open the elbow-valves on the collapsible tanks.
- f. Start the pump and refuel the helicopters.

3. Completion of operation:

- a. Shut down pump and close elbow valves.
- b. Disconnect bond wire to helicopter and roll up hose.
- c. Disconnect ground wire from pump and aircraft.
- d. Place pump and hose back in Caribou and secure.
- e. Readjust tank tie-downs to secure containers.

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Monthly Test Report Number 2 — Caribou

ANNEX I — Objective 9 (continued)

4. Removal of equipment from CV-2B:
 - a. Remove equipment tie-downs.
 - b. Remove all equipment from aircraft on to 2½ ton trucks or fork-lift trucks.
 - c. DO NOT DISCONNECT ANY HOSES INSIDE AIRCRAFT.
 - d. Drain dispensing equipment in a safe area if it is to be stored; disconnect and drain hoses.

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Monthly Test Report Number 2 -- Caribou

ANNEX J -- Objective 10 (Weather-avoidance radar)

1. (C) Objective.

To determine the capability of the GV-2B Caribou aircraft to operate under adverse weather conditions utilizing weather radar.

2. (U) Discussion.

Five sets of airborne weather-radar will be available for testing in Caribou aircraft during the approaching monsoon season. Results will be reported as obtained.

3. (U) Findings.

None

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Monthly Test Report Number 2 -- Caribou

ANNEX K -- Objective 11 (Airborne command post)

1. (C) Objective.

To determine the feasibility of installing and operating an airborne command post for control of combined operations.

2. (C) Discussion.

a. Two heliborne assault operations were conducted in March. Both operations employed a CV-2B aerial command post.

b. The communications system was the same as described in Test Report Number 1 (Aircraft Radios and two AN/PRC-10's). The system is designed to maintain communications between the Command Post and the forces participating in the assault. (see Tab K-1). The present system remains unsatisfactory. A new system is being readied which will provide a UHF, a VHF, 2 FM radio circuits, an intercom system and six operating positions. The new communication system will be a portable console arrangement designed for quick installation and removal.

c. Initial concepts of the airborne command post called for it to operate from an altitude of approximately 8000 feet (MSL) in order to maintain communications with mission staging areas. On the missions flown in March, low cloud layers in the assault areas made it necessary to operate the Command Post from an altitude of approximately 1500' above the terrain. Operations at the lower altitudes placed the command post aircraft in the maneuvering area and airspace required by fighter-bomber and troop lift aircraft. Additionally, the command post aircraft was exposed to insurgent small arms fire, friendly artillery, and fire from fighter aircraft pulling up from strafing runs with their weapons still activated.

3. (C) Findings.

a. The concept of the airborne CP is valid but the full value of the system cannot be determined until satisfactory communications are provided.

b. Airborne CP operations may not be feasible during periods of low cloud cover without sacrificing either safety and communications with the staging area or vision of the battlefield.

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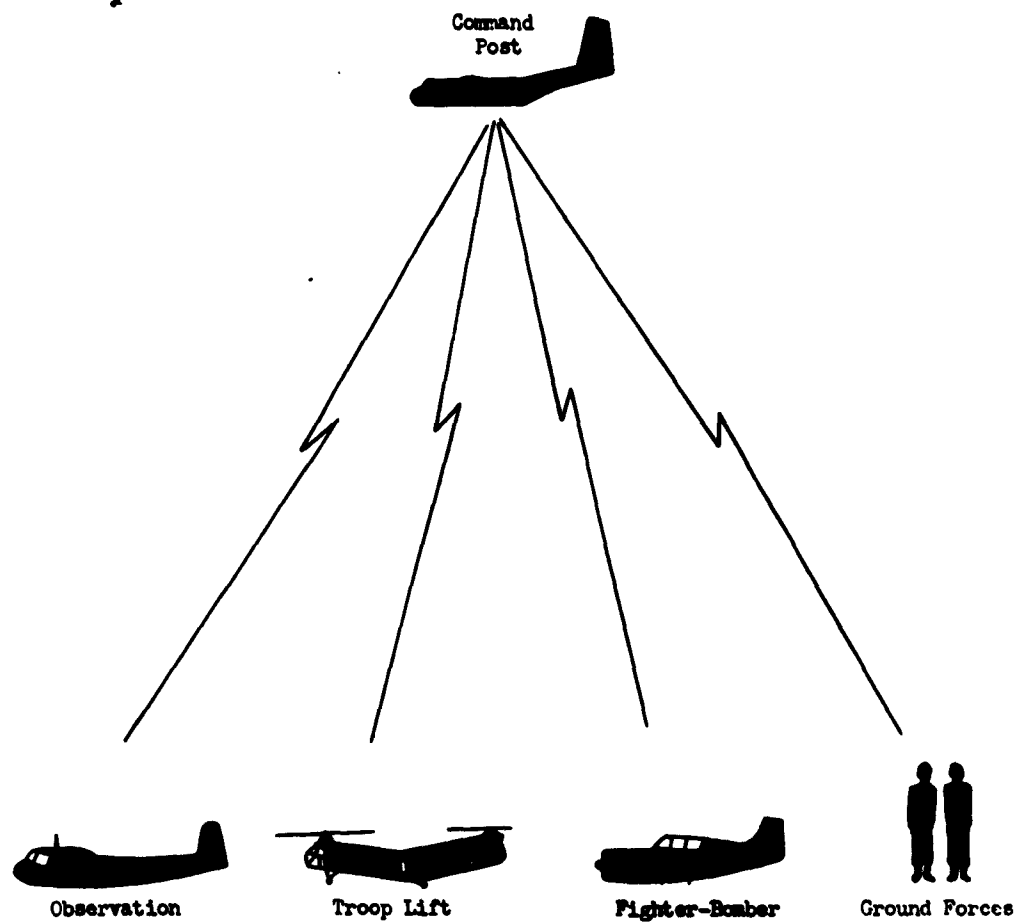
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Proposed Communications for Airborne Command Post



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ANNEX I -- Objective 12 (Logistic support requirements)

1. (C) Objective.

"To determine the logistic support requirements of the CV-28 Caribou Company to include air base facilities, supply levels, personnel and equipment, POL personnel and equipment, and other support requirements".

2. (C) Discussion.

a. Personnel.

(1) There will be a turnover of 1st AVCO personnel during April, May, and June 1963. Approximately one third of the unit will depart each month for the CONUS. Rotation dates of returnees have been staggered to provide continuity of operations during the turnover. (See Tabs L-1 and L-2). Projected arrival dates of aviators appear to permit a sufficient overlap period with departing aviators for orientation and area familiarization. Seven replacement enlisted men including the new First Sergeant, arrived in the RVN 27 March 1963. Firm arrival dates ranging from 1 April to 30 June 1963 have been received on ten other enlisted men. USASGV has been informed that 50 enlisted replacements (MOS unknown) will arrive on or about 1 May 1963. It cannot be determined if the exchange of enlisted personnel will allow a desired overlap period for training of the new replacements.

(2) The advance party of the 70th Transportation Detachment (DS) consisting of one warrant officer and three enlisted men, arrived in the RVN on 27 March. Personnel of the main body are scheduled to arrive on 4 April, and the unit's organic equipment is expected to arrive on 14 May. The 70th Transportation Detachment was organized and trained at Ft. Eustis, Virginia. Familiarization CV-28 maintenance training was conducted at Ft. Bragg, N.C. with the 61st AVCO.

(3) Adequacy of the number of aviators authorized by the TOE is under study. Factors considered include:

(a) The number of aviators assigned to command, operations, maintenance and other duties that preclude their performing regularly scheduled flight missions.

(b) Average number of hours flown by the aviators of the transport platoons.

(c) Fatigue or strain on the air crew caused by frequency of landings and take-offs requiring maximum performance of the aircraft and concentration of the air crew.

(d) The average hours of work performed by aviators in a 24-hour period.

(e) The possibility that, depending on aircraft availability and airfield facilities, around-the-clock operations could be implemented.

b. Aircraft maintenance and supply.

(1) The required ratio of maintenance man-hours to each flying

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ACTIV-AM
Monthly Test Report Number 2 -- Caribou

ANNEX L -- Objective 12 (continued)

hour is also under study. Records of the 1st AVCO do not include maintenance man-hours expended; however, reasonable estimates can be obtained from recorded aircraft maintenance performed. Tab L-3 reflects maintenance man-hour computations for March. Approximately five months will be required to gather sufficient data to compute a reliable maintenance man-hour factor.

(2) Aircraft availability for March is graphically depicted on Tab L-4. The average daily availability rate was 11.6 aircraft which is 72.5 per cent of the total aircraft authorized. Float aircraft were not considered in the computations. Tab L-5 illustrates comparative aircraft availability and hours flown during January - March.

(3) Tab L-6 lists the shortage of critical supply items required for aircraft maintenance. Because of these shortages 1st AVCO has had to resort to aircraft part cannibalization and field expedients to prevent EDP status and to maintain a relatively high availability rate. As examples, first, tachometers from an aircraft about to undergo a periodic inspection were removed and installed on a different aircraft to permit the second aircraft to return to a flyable status. Second, tadpole seals used on engine fire walls were fabricated by 1st AVCO during the period they were not available in supply channels. They are inferior in quality to standard seals, but their use has prevented the grounding of aircraft.

(4) Maintenance support kits issued at the port of embarkation to 1st AVCO were inadequate and in some cases, inconsistent with latest aircraft modifications. The kits contained spare parts based on a CONUS planning factor of 30 flight hours per aircraft per month. 1st AVCO's flying hour program in the RVN combined with its maximum performance operations from small, unimproved air strips substantially increased maintenance and aircraft parts replacement. This combination depleted the support kits and parts supply rapidly. There was also an insufficient quantity of brake linings and tires. Exhaust system spare parts stocked in the support kits had not been exchanged to conform with an earlier modification of this system. Consequently, these parts could not be installed in the unit's aircraft.

(5) 1st AVCO has completed an "in-house" evaluation to determine if pre-flight inspection could replace the daily end-of-day inspection presently required by TM 55-1510-206-20. During the evaluation two CV-28 aircraft were flown 100 hours each. There was no daily inspection (which requires approximately three maintenance man-hours). The air crew conducted its normal pre-flight inspection only. Discrepancies detected during the pre-flight inspection or during flight were deferred to the intermediate or periodic inspections providing they did not present a hazard to flight safety. Intermediate and periodic inspections were completed at the prescribed time intervals during the evaluation. Results were as follows:

- (a) Approximately 102 maintenance manhours were conserved.
- (b) Aircraft were available for employment during longer daylight periods.
- (c) Intermediate and periodic inspections of the aircraft did not reveal abnormal deficiencies or discrepancies.

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ANNEX L — Objective 12 (continued)

(6) Half of the Aircraft Repair Kit (common hardware kit) issued the 1st AVCO is not usable. This kit is a CONEX (Container, express) with shelves and bins installed and contains hardware items, i.e., nuts, bolts, cotter keys, pins, washers, that are common to all aircraft in the Army inventory. Hardware peculiar to the CV-2B aircraft are not included in the authorized stockage list. Several of the hardware items are overstocked. Present usage rates do not justify the quantity. A hardware kit specially designed for performing maintenance on the CV-2B would enhance the maintenance effort and would not require an additional container or added weight. Slow-moving items should be issued commensurate with the expenditure rate.

c. Equipment.

1st AVCO has never been issued a "truck, oil, 1200 gallon capacity with pre-heating device and pump" authorized by the TOE. The unit has used, since its arrival in SE Asia, a standard M-49C 1200 gallon tank truck with the filter segregator removed, in lieu of the authorized item. This vehicle has proven adequate and satisfactory under the conditions encountered in the RVN.

3. (C) Findings.

a. Five months' observation will establish a reliable maintenance man-hours versus flying hour factor for the CV-2B.

b. Cannibalization of aircraft parts and field expedients has assisted in maintaining the present aircraft availability rate of 72.5%.

c. Maintenance support kits issued to the 1st AVCO at the POE were inadequately stocked and some repair parts were obsolete because aircraft modifications had been accomplished prior to their issue.

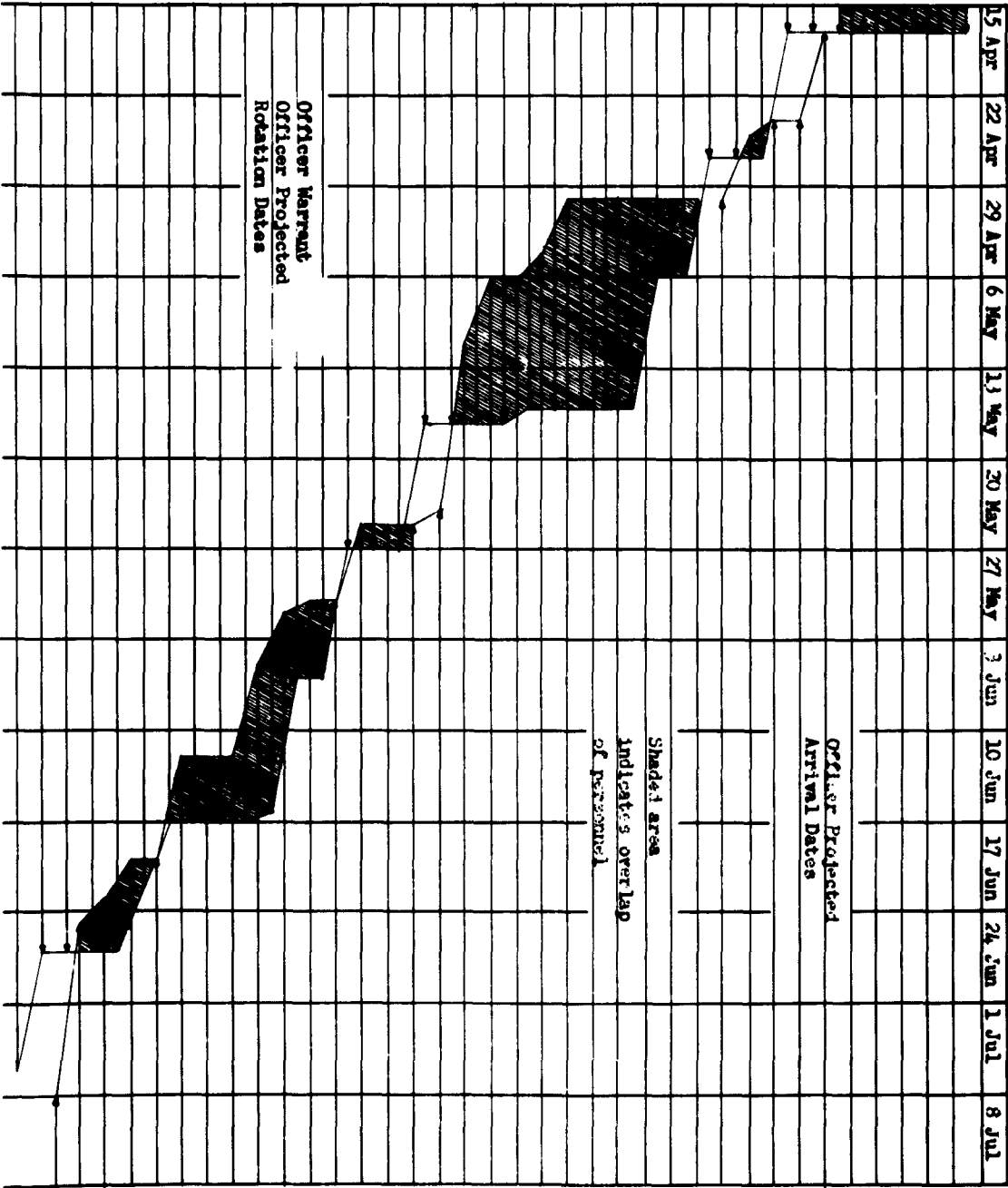
d. Pre-flight inspection in lieu of daily inspection shortens aircraft down time and may save over-all maintenance time.

e. The Aircraft Repair Kit (common hardware kit) stockage list is inadequate and should be revised to reduce the quantity of slower-moving items and include only those items of additional hardware peculiar to the CV-2B.

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Monthly Test Report Number -- Caribou
Appendix 1 to Annex L



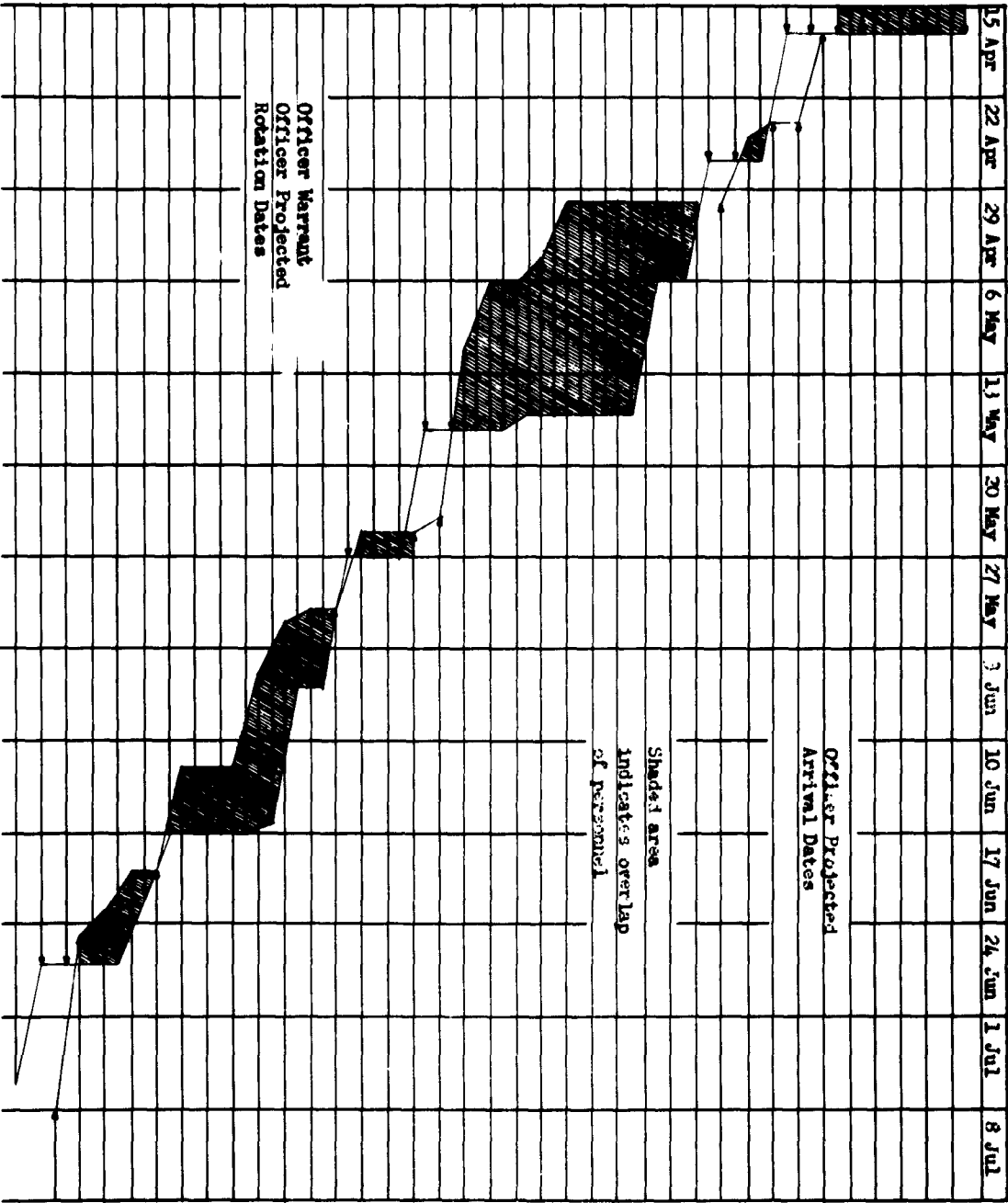
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Monthly Test Report Number -- Caribou
Appendix 1 to Annex L



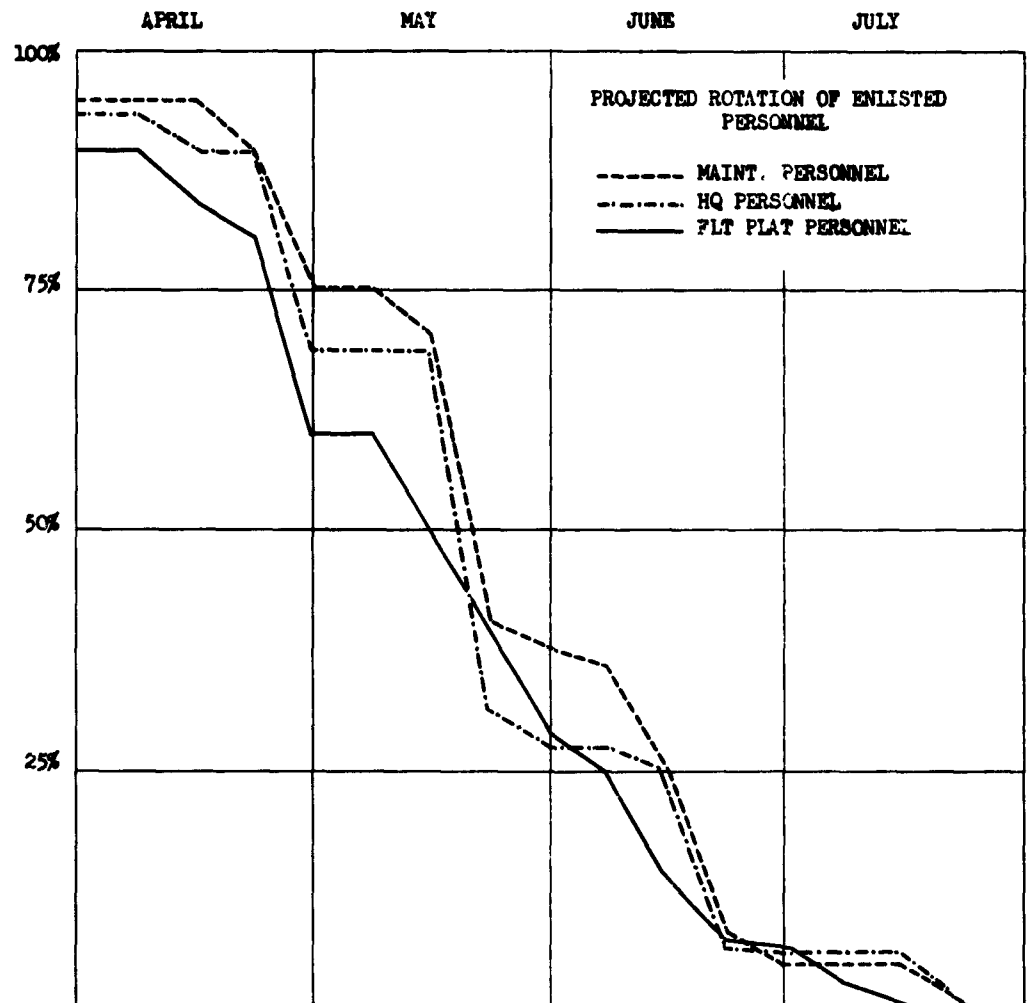
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Monthly Test Report Number 2 — Caribbean
Appendix 2 to ANNEX 1 - Objective 12 (continued)



TAB L-2

TAB L-2

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Monthly Test Report Number 2 -- Caribou

ANNEX L -- Objective 12 (continued)

Maintenance manhours per flying hour.

<u>Type Maint</u>	<u>No.</u>		<u>Maint man- hours each</u>		<u>Maint manhours</u>
Daily inspection	318	X	3	=	954
Intermediate inspection	42	X	5	=	210
Periodic inspection	11	X	350	=	3850
Demand					<u>1500</u>
					6514

$\frac{6514 \text{ Maint Manhours}}{1059 \text{ Flying Hours}} = 6.1 \text{ maint manhours per flying hours.}$

NOTE: Daily inspections are required after the last flight of the day or prior to the next flight.

Intermediate inspections are required at 25 flight hour intervals.

Periodic inspections are required at 100 flight hour intervals.

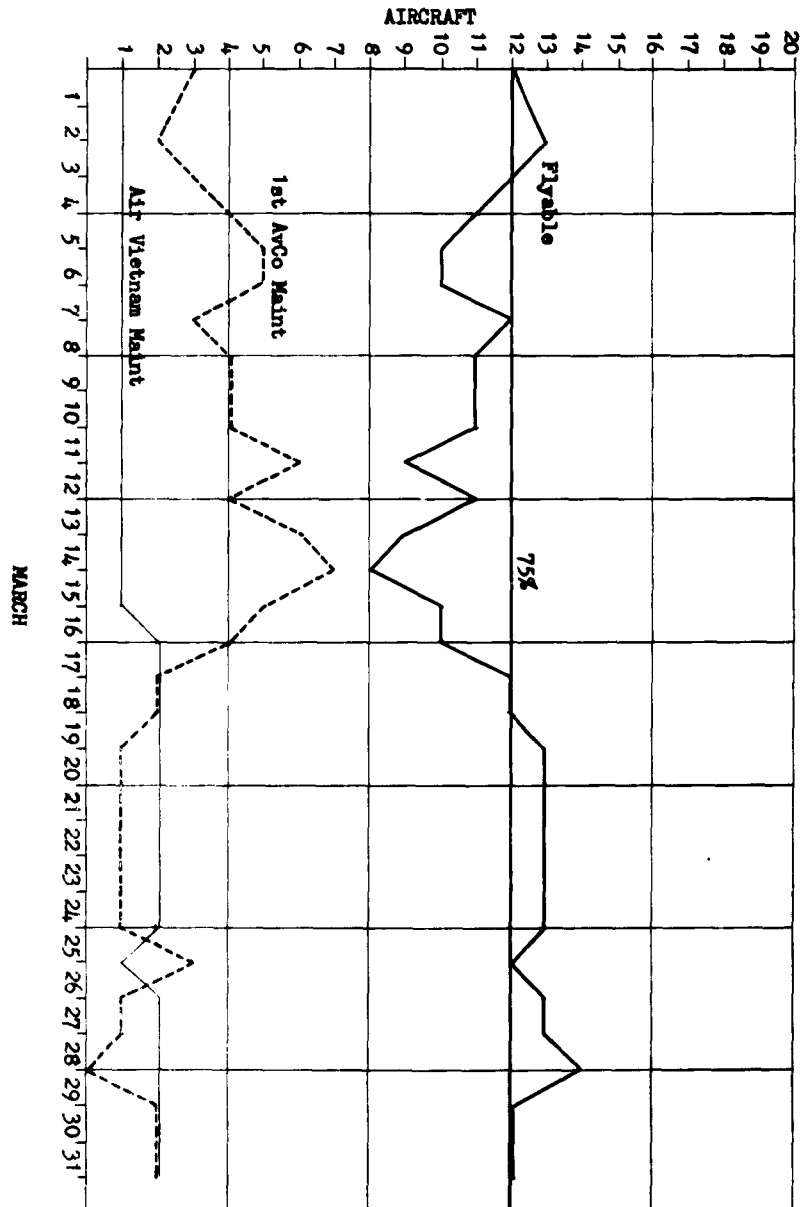
Demand maintenance includes all maintenance not done during one of the inspections.

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Appendix 4 to ANNEX L -- (Aircraft availability)



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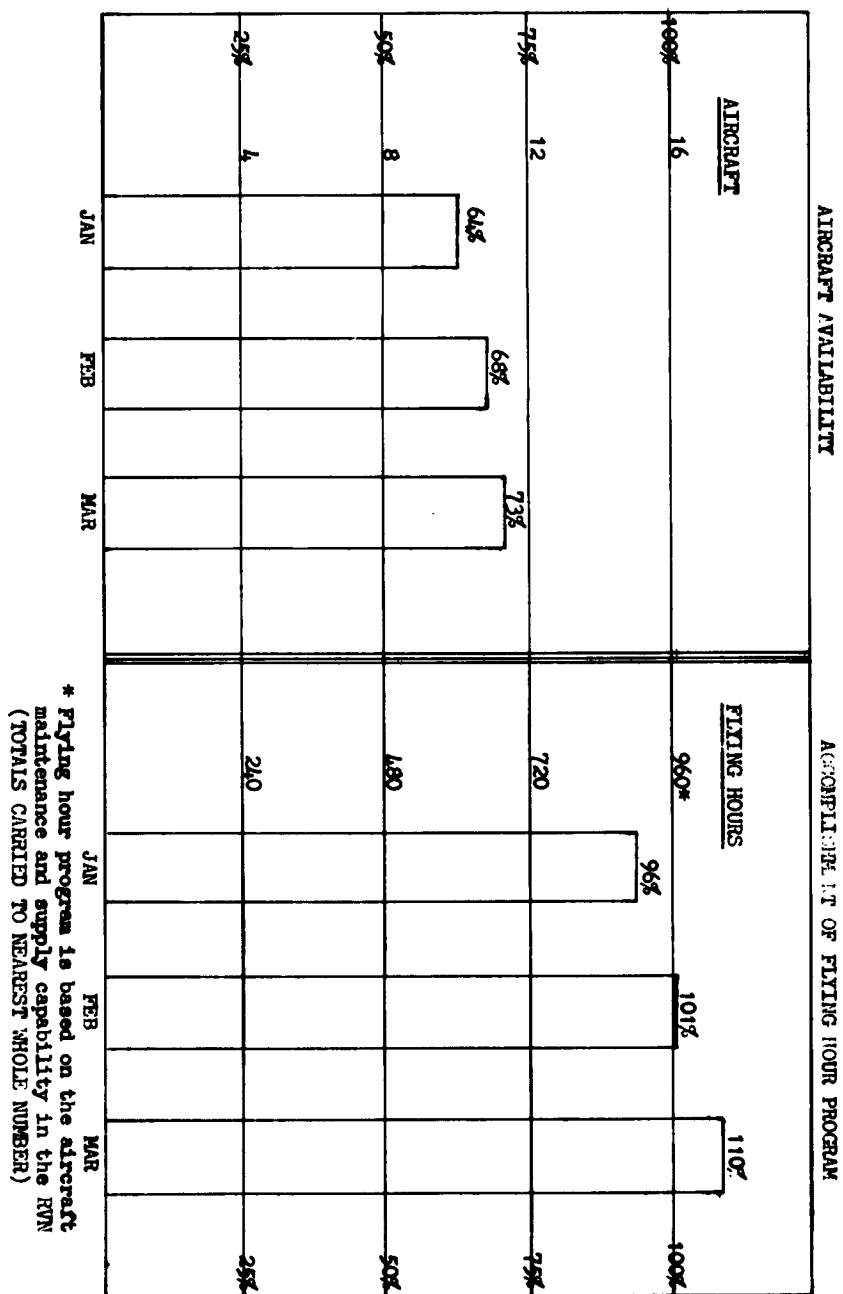
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Appendix 5 to ANNEX L

Comparative aircraft availability and hours flown during the period Jan, Feb, Mar 63



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Monthly Test Report Number 2 -- Caribou

ANNEX L -- Objective 9 (continued)

Critical aircraft spare parts on requisition.

<u>Nomenclature</u>	<u>FSN or P/N</u>	<u>QTY</u>	<u>DATE REQ'D</u>
Lining, brake	FSN 1630-602-3888	424	1 Jan 63
Wheel assembly	" 1630-474-8231	3	11 Jan 63
" "	" "	1	16 Jan 63
Bearing	P/N KSYB 5-123	32	28 Jan 63
Oil temp bulb	FSN 6685-527-7354	1	4 Feb 63
Pipe assembly	" 1560-022-9855	2	20 Feb 63
Seal, tadpole	P/N C4P 1814-23	36	26 Feb 63
Pipe assembly	FSN 1560-022-9855	28	5 Mar 63
Indicator, tachometer	" 6680-712-1424	1	11 Mar 63
" "	" "	2	14 Mar 63
Oil temp bulb	" 6685-527-7354	1	16 Mar 63
Indicator, tachometer	" 6680-712-1424	2	28 Mar 63
" "	" "	2	29 Mar 63
Transmitter(oil pressure)	" 6620-557-5557	2	29 Mar 63

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Monthly Test Report Number 2 -- Caribou

ANNEX M -- Objective 13 (Medical Evacuation)

1. (C) Objective.

To evaluate the capability of the CV-2B Caribou Aircraft when employed in the Medical Evacuation role, to include requirements for aid-men, medical equipment and supplies, and suitability of present interior configuration for this role.

2. (C) Discussion.

a. By TWX SDEG-DO S-138 from CG USADC, dated 131855Z this objective was approved for inclusion in Field Test, CV-2B Caribou Company.

b. No data were collected subsequent to receipt of approval of objective.

c. Results of observations in support of this objective will be submitted in future reports.

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Monthly Test Report Number 2 -- Caribou

ANNEX N -- Letters from U.S. Advisory Personnel

ATTACHMENTS:

Letter N-1 From Deputy Senior Advisor, II Corps, 1 April 1963

Letter N-2 From Senior Advisor, II Corps, March 1963

Letter N-3 From Senior Advisor, III Corps, 8 March 1963

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UNITED STATES ARMY
MILITARY ASSISTANCE ADVISORY GROUP, VIETNAM
II VN CORPS DETACHMENT
Pleiku, Vietnam

MAGTN-IIC

1 April 1963

Colonel James Lee
ACTIV, APO 143, US Forces
ATTN: Air Mobility Section - Caribou

Dear Jim:

As a result of my listening in the last Army Air Conference in Saigon here are some observations here at Pleiku.

A direct support element of the 1st Aviation Company (FWLT), composed of two CV-2B (Caribou) aircraft, has been under operational control of the II Corps Senior Advisor. The two aircraft were originally stationed at Nha Trang in close proximity to II CALC and in December 1962 one aircraft was deployed to II Corps Headquarters at Pleiku to better the Caribous' responsiveness to the needs of the Corps.

Though the Caribou crews commenced their support of the Corps during the rainy season, they were able to use the Pleiku airstrip continuously throughout, in spite of low ceilings and the lack of an approved radio approach facility for the field. For several weeks during the rainy season operating limitations prevented USAF aircraft from getting into Pleiku, and the Corps experienced critical supply shortages (particularly rations). As a result, it was necessary to establish regular aerial resupply runs from Nha Trang to Pleiku using the Caribou which could and did use the Pleiku strip in spite of low ceilings and lack of an approved radio approach facility at the field.

The Caribou has been continuously used due to its ability to utilize marginal strips. An average of fifty passengers per day are transported between Air Strips in the Corps Zone many of which cannot be served by USAF Aircraft, (i.e. Cung Son, Phu Bon, Tan Can, Bato, Van Can and Plei Vrong). The high water table characteristic, of much of the Corps Zone, during the late summer monsoons and poor sub-grade soils result in unacceptable airstrip bearing ratios for use by heavier aircraft such as the C-123. Phu Bon for example was closed to C-123 aircraft because continuous use was causing excessive rutting of the base course through the PSP surface. The CV-2B is also tailored for the typical "feeder" type load which, for reasons of weight or bulk cannot be carried by smaller aircraft, and the load is not large enough to warrant using a C-123.

One of the most significant contributions of the CV-2B crews in II Corps has been their responsiveness to last minute unforeseen missions. This applies in particular to transport of critical items to users in the field to include signal items, weapons, ammunition, and parts for deadline equipment. During the Corps reorganization of December 1962, II Corps was suddenly faced with the need to establish communication with its newly acquired Quang Ngai Province. A generator and signal equipment were needed immediately for a radio relay at Plateau Gi in Kontum province to establish communication between II Corps and Quang Ngai Province. Experience for

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MAGIN-11C
Colonel James Lee

1 April 1963

requests of this sort through Air Force channels has shown an average lag time of seven to ten days. With only one day's notice, a Caribou crew transported the required equipment to Plateau Gi. A critical shortage of shotguns in a Civil Guard unit during the week of 10 March 1963 restricted the units effectiveness. A request through the Air Force airlift system would have delayed these much needed items for several days. The Corps CV-2B completed the haul on the same day of the request. These are by no means abnormal examples of the need the Corps Senior Advisor has for an immediate flexible airlift capability if he is to assist ARVN.

Two other variables which must be dealt with daily are weather and communications. During the Monsoons aircraft must be prepared to transport cargo on two or three hour's notice of a break in the weather to preclude a waste of days or weeks for sustained improvement in flying conditions. The Corps Senior Advisor's immediate access to the Caribou crews gives him this required flexibility, not possible under a system which requires loads to be manifested at least twenty-four hours in advance. In-adequate communications, particularly at remote Special Forces outposts result in excessive delays in transmitting Mission requests through the Air Force airlift system. Special Forces Teams are forced to appeal to the more immediately responsive Army channels for assistance.

In the past, II Corps advisors on official visits to Saigon have consistently experienced delays in returning to Pleiku. The Air Force require personnel to be manifested twenty-four hours in advance of the desired departure date. II Corps personnel have actually been delayed three to four working days following completion of their business in getting Manifested by the Air Force. These holdovers in Saigon have adversely affected the Advisory Effort within II Corps. Presently, a Caribou departs Pleiku each Wednesday at 0630 carrying those people with business in Saigon, departs for Pleiku at 1630 the same day, saving many work days and at the same time complying with the MAAG Memo 55-2 in reducing TDY travel.

Though the foregoing has indicated satisfaction with the quality of CV-2B support in II Corps, we are daily faced with the inadequate quantity of this support, approximately fifty percent of all mission requests must be turned down due to lack of aircraft. Many of these requests come from Special Forces Teams who cannot get adequate support through the Air Force airlift system. Two more Caribous are urgently needed to support the Vietnamese Army and Special Warfare effort within the II Corps Tactical Zone.

I strongly feel that this additional CV-2B support must be retained under the operational control of the Corps Senior Advisor. Pooling of Caribou resources at higher level would only result in degrading of the quick responsiveness and flexibility which have made the Caribou support so singularly effective in this Corps.

Sincerely,

/s/ Rowland H. Renwanz
/t/ ROWLAND H. RENWANZ
Colonel, Armor
Deputy Senior Advisor

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UNITED STATES ARMY
MILITARY ASSISTANCE ADVISORY GROUP, VIETNAM
II VN CORPS DETACHMENT
Pleiku, Vietnam

MAGTN-IIC

March 1963

SUBJECT: Request For Additional Aviation Support (U)

TO: Commander, U.S. Military Assistance Command, Vietnam
Saigon, Vietnam Attn: J-4

1. (C) Request two (2) additional CV-2B Caribou aircraft be placed in direct support of II Corps to meet aviation support requirements.

2. (C) Justification for this request is as follows:

a. The two (2) CV-2B Caribou aircraft presently allocated to II Corps are available for a total of 160 aircraft hours per month. In order to maintain courier flights, perform necessary command, liaison, administrative, and logistical functions, support Special Forces and meet requirements for VIP parties, II Corps has a minimum requirement in excess of 292 hours per month. On 10 March, this requirement will increase to 327 hours per month. Each month it is necessary to cancel regularly scheduled flights in order to fly higher priority missions.

b. Presently, II Corps operates a scheduled courier flight through out the Corps Zone on 5 days per week. This expends approximately 110 aircraft hours per month. There is an existing requirement to increase this to 6 days per week, or a minimum of 132 flight hours per month. Available courier flight space for both personnel and cargo is inadequate to meet demand.

c. Support of II CALC activities requires 100 aircraft hours per month. Less than 50 hours per month can be allocated at present. Upon assumption of logistical support for the 25th Division at Quang Ngai on 10 March 1963, the II CALC requirement will increase to an estimated minimum of 135 hours per month.

d. Support of Special Forces activities requires approximately 60 hours per month. Only a small portion of this requirement can be met, necessitating delay in Special Forces activities and causing sensitive or priority cargo to be transported overland. Special Forces has a requirement for delivery of 80,000 pounds of cargo per month at Mang Buk. At present supplies are being air dropped resulting in an estimated 30% loss due to damage. With additional CV-2B aircraft, these supplies can be delivered with the "touch and go" system.

e. There is an ever increasing requirement for transportation in order to conduct planning and coordination conferences. The tempo of "Clear and Hold" Operations in II CTZ has reached the level where increased governmental support activities has generated a corresponding increased aviation support requirements. The movement of Medical Teams, equipment, supplies, emergency food and clothing for refugees and equipment for Strategic Hamlets are a few of the areas now requiring aviation support.

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NAGTN-IIC

March 1963

SUBJECT: Request For Additional Aviation Support

f. It is often necessary to use CH-21C helicopters for movement of cargo which could be more economically moved by Caribou. Use of helicopters in this type support reduces the number of aircraft available for airmobile operations.

3. (C) In view of the facts listed above, it is urgently requested that full consideration be given this matter and steps be taken to expedite allocation of two additional CV-2B Caribou in support of II Corps.

/s/Hal D. Mc Cown
/t/HAL D. Mc COWN
Colonel, Infantry
Senior Advisor

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U. S. MILITARY ASSISTANCE ADVISORY GROUP
III CORPS
SAIGON, VIETNAM

MAGTN-IIIC-3

8 March 1963

MEMORANDUM FOR: Commander, U. S. Military Assistance Command, Vietnam,
Saigon

Chief, U. S. Military Assistance Advisory Group, Vietnam,
Saigon

Chief, U. S. Army Section, Military Assistance Advisory
Group, Vietnam, Saigon

SUBJECT: Army Fixed-Wing Aircraft Requirements, III Corps

1. GENERAL:

a. During recent months there have been a variety of proposals from various sources regarding the employment of Army aircraft. Consequently, it is considered desirable to reappraise from the viewpoint of a Corps Senior Advisor certain conclusions and recommendations regarding the assignment and employment of Army fixed-wing aircraft in support of III Corps and subordinate unit advisory staffs.

b. Different agencies have needs for different types of aircraft. There is a need in South Vietnam for medium and heavy airlift, such as may be furnished by the C-123. III Corps has no need for C-123's in direct support. III Corps does very definitely have a requirement for light airlift aircraft, such as the CV-2B Caribou, in direct support. What is more, III Corps Advisory Detachment requires these aircraft, and all aircraft, on both a preplanned and an immediate-response basis.

c. A big selling point of Army Aviation has been its immediate responsiveness to the needs of the user, because the aircraft are assigned to him and are controlled by him. This is fundamental in justification of aviation organic to the Army, and any move to take control from the user would represent a step backward. For example, because the roads in many areas of South Vietnam are not secure, there is often a requirement to move small numbers of troops and supplies by air. If the Corps Advisory Staff were required to go to another agency for the aircraft, with all of the telephone calls, coordination, and justification attendant upon the aircraft request, the aircraft would not be immediately responsive to the requirement.

2. Present Stationing Plan of Army Fixed-Wing Aircraft, III Corps.
The following fixed-wing aircraft, from the units indicated, are stationed and provide support to III Corps as follows:

<u>AIRCRAFT</u>	<u>MISSION</u>	<u>STATION</u>
1 U-1A from 18th Trans Co	DS SA 23d Div	BAN ME THUOT
1 U-1A from 18th Trans Co	GS III Corps	SAIGON
2 CV-2B from 1st Avn Co	GS III Corps	VUNG TAU

3. Fixed-Wing Aircraft Situation, Outlook, and Requirements.

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MAATW-IIIC-3

8 Mar 1963

SUBJECT: Army Fixed-Wing Aircraft Requirements, III Corps

a. CV-2B Caribou.

(1) At present, the two CV-2B Caribou are barely adequate to support the Corps advisory effort with supply and personnel airlift. Utilization varies, from a very few occasions when they are not used at all, to days when both are used extensively, and two or three more could be effectively employed. These two airplanes cannot adequately support requirements of our ARVN counterparts, nor is their use so intended at this time.

(2) The Caribou is a multi-purpose aircraft, designed for forward battle area tactical and logistical support, and was not intended solely for airlift of cargo. This aircraft was designed with a short field landing and take off capability. Consequently, it is and should remain assigned and employed by tactical units in a variety of "work horse" type missions. Any aircraft can provide effective communication and coordination, and the CV-2B itself is admirably suited for command and staff liaison between Corps Headquarters and subordinate elements. One of the best methods to execute MACV, MAAG, and GVN policy in Vietnam is through face-to-face contact between higher and lower headquarters advisors and between ARVN commanders and their subordinates. In this Corps, CV-2B aircraft have been and are being used for this purpose when necessary, and the success of such missions is not to be measured in ton-miles.

(3) With two additional CV-2B aircraft, it would be possible to increase our regularly scheduled "milk-run" flights, still reserving one aircraft for special missions. By so doing, we could serve our field detachments better, and also, to a degree, accommodate our ARVN counterparts in certain valid inspection and coordination missions. This latter type mission undoubtedly accelerates the accomplishment of US objectives in Vietnam, and in this the ARVN commanders are presently neither provided with their own organic aviation nor with immediately responsive support from VNAF.

b. U-1A Otters.

(1) The U-1A Otters have proven to be possibly the most valuable single type of aircraft in this country, filling a critical need for movement of small numbers of personnel or small amounts of supplies into small airfields, when a T-28 airplane would be too small to do the job, and larger airplanes (or helicopters) would be unfeasible or uneconomical. The fact that these aircraft have been employed so well is to the credit to the 18th Transportation Company.

(2) Within III Corps, Otters are urgently needed on a daily flyable basis, as follows:

(a) One each in support of Senior Advisors to the 5th and 23d Division and one in support of Senior Advisor to PHUOC BINH THANH Special Zone.

(b) At least one aircraft in support of Hq III Corps.

(3) U-6A Beaver airplanes could be utilized in some cases for the above roles, and in many cases more economically. However, the cost of the higher-payload Otter is not so much greater as to justify replacing it with the smaller airplane.

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MAGTN-IIIC-3

8 March 1963

SUBJECT: Army Fixed-Wing Aircraft Requirements, III Corps

c. TO-1D Bird Dogs.

(1) This headquarters has been criticized for using large aircraft for "L-19 missions". The answer to this is not to cancel the mission, which takes first consideration, but to provide the L-19's. The L-19 (TO-1D), where available in Vietnam has become a valuable and inexpensive vehicle for light-load missions. In this Corps, it could be used for numerous one-man missions (such as pay runs), for reconnaissance prior to operations, for command and control during operations, and for a multitude of administrative flights between higher and lower headquarters. It would be useful to assign one of these to each Sector Advisor plus all higher headquarters, which would require approximately twenty aircraft. It would be extremely useful to assign two each in support of Senior Advisors to the Divisions, PHUOC BINH THANH Special Zone and Headquarters III Corps.

5. CONCLUSIONS:

a. The effectiveness of the U.S. advisory effort in Vietnam is closely allied to the availability of Army aircraft for liaison, coordination, communication, mobility, and forward area administrative and logistical support.

b. The person or agency that uses aircraft must have operational control of those aircraft. So long as Army aircraft cannot be assigned or attached to Corps Advisory Teams, they must at the least be placed in direct support of the Corps Senior Advisor.

c. A requirement exists within III Corps for a total of four CV-2B aircraft on a flyable daily basis.

d. A requirement exists within III Corps for a total of four flyable U-1A Otter airplanes on a daily basis.

e. A requirement exists within III Corps for a total of eight TO-1D airplanes, both for their own demonstrated usefulness and to prevent the necessity for filling their missions with larger aircraft or with helicopters.

6. RECOMMENDATIONS:

a. That two additional CV-2B aircraft be assigned in direct support of Senior Advisor, III Corps. for a total of four such aircraft.

b. That a total of four U-1A Otters on a daily flyable basis be assigned in direct support of Senior Advisor, III Corps.

c. That a total of eight TO-1D Bird Dog airplanes be obtained and assigned in direct support of Senior Advisor, III Corps.

/s/Wilbur Wilson
/t/WILBUR WILSON
Colonel, Infantry
Senior Advisor

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ACTIV-AM

Monthly Test Report Number 2 -- Caribou

ANNEX O -- Ground Fire Damage to Aircraft.

1. During the period 1 March to 31 March 1963, five Caribou aircraft were hit by small-arms ground fire; two of the five had to be grounded for repair of damage.

2. Location of hits on the five aircraft are shown on succeeding pages. A summary of hits follows:

a. <u>Aircraft number</u>	<u>Date Hit</u>	<u>Geographic Location</u>	<u>Number of hits</u>	<u>Days for repair</u>	<u>See pages</u>
60-5441	10 Mar	Can Tho	1	None*	2
60-5438	13 Mar	Tabat	1	1½	2
61-2394	14 Mar	Trung Lap	4	10	2 and 3
60-5439	20 Mar	Unknown	1	None*	1, . and 4
61-2389	22 Mar	Gia Vuc	1	None*	1, 2, 3 and 4

* Repaired during PE. No time lost for repair.

b. Point of bullet entry:

Bottom of aircraft - 5

Right side - 0

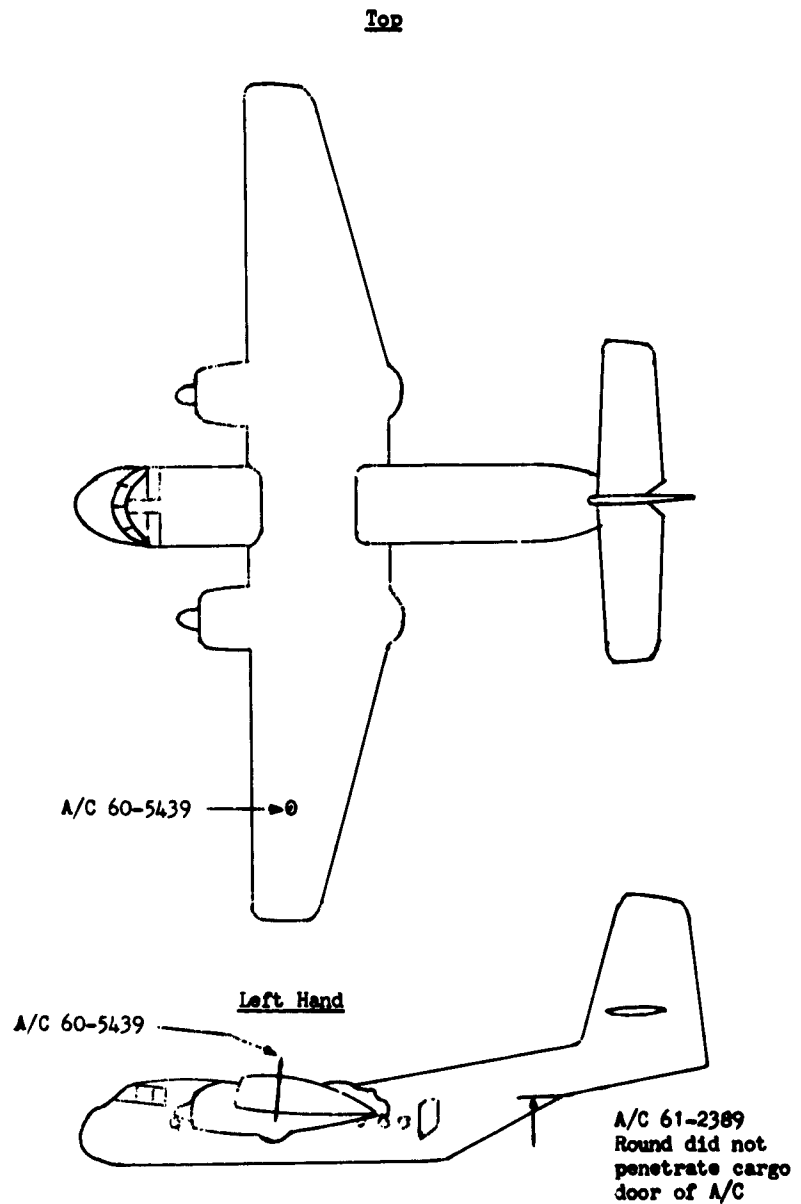
Left side - 3

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LEGEND: ○ Circled dot indicates hit on aircraft
○— Indicates path of projectile

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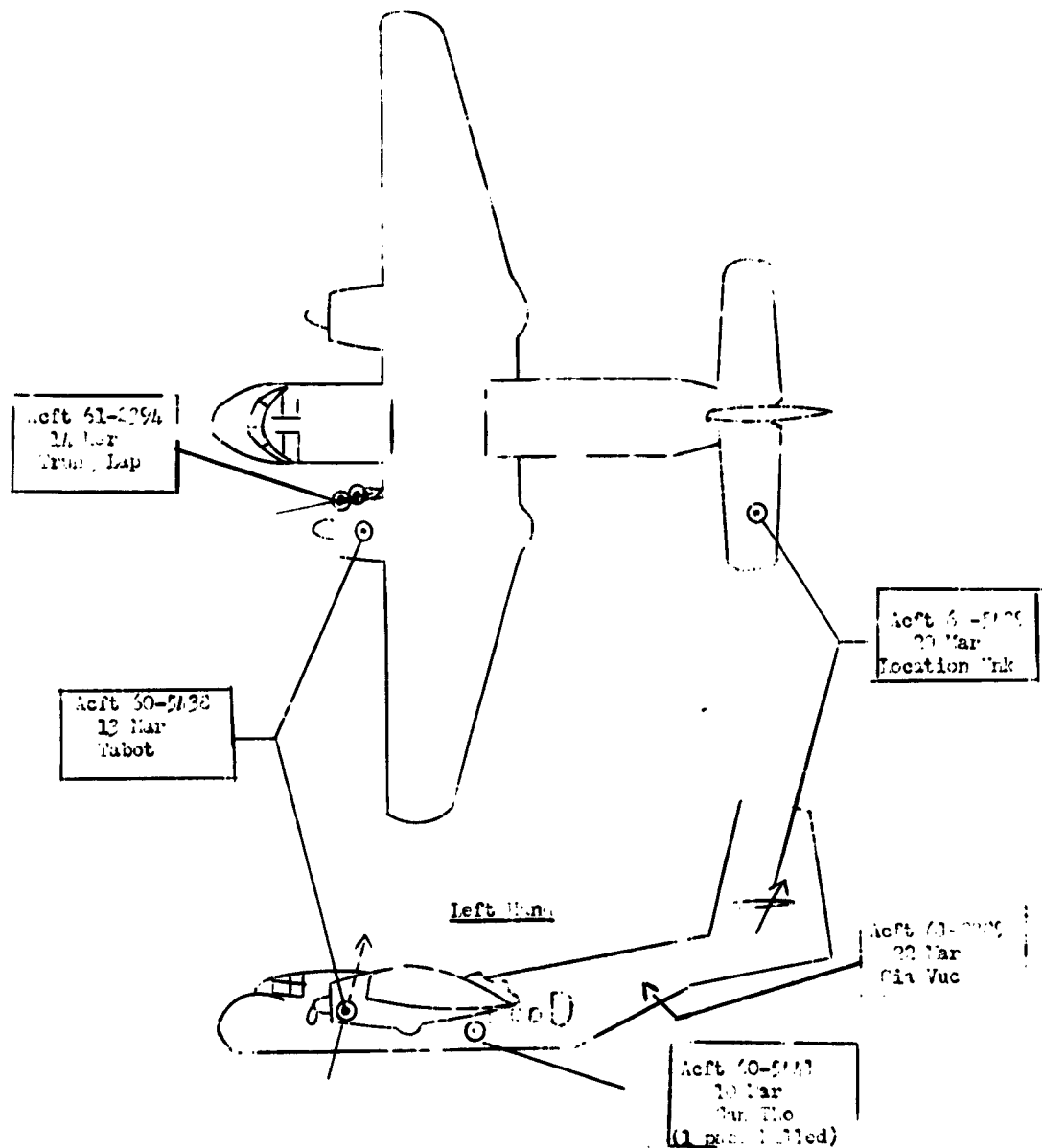
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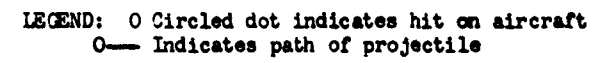
Indicate all hits on aircraft by circled dot. If possible, indicate path of projectile through aircraft by dotted line from point of entry to point of exit, with arrow showing direction, e.g., 6--- --- ---6. Where known, indicate type of projectile or frag.

Top



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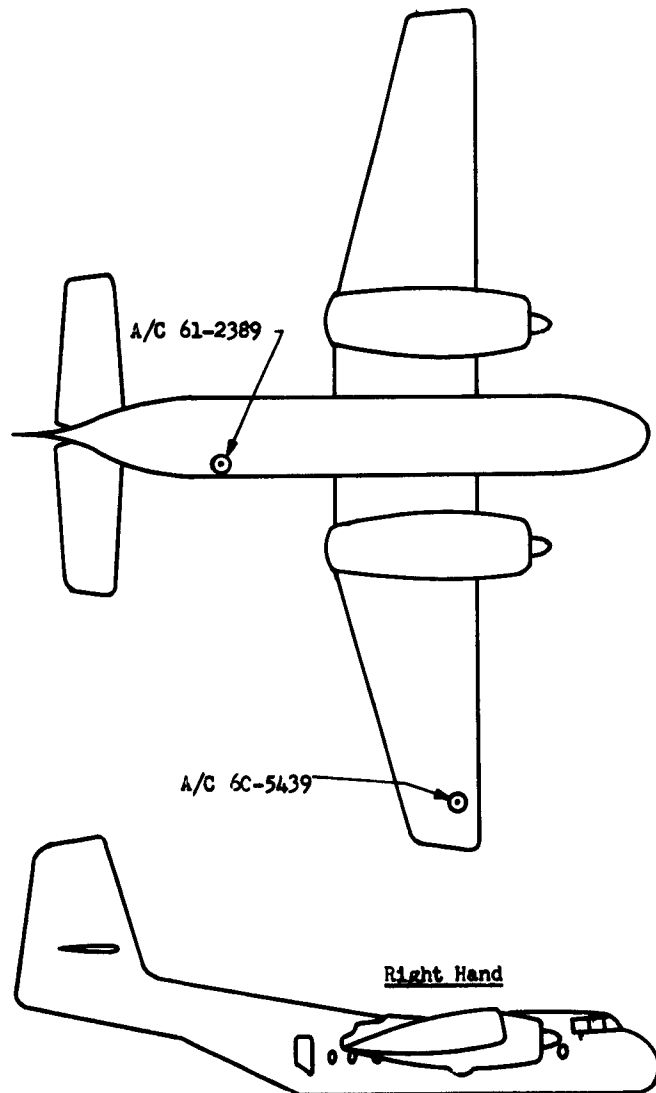
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Bottom



Right Hand

LEGEND: ⓪ Circled dot indicates hit on aircraft
⓪— Indicates path of projectile

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